Series 1959, No. 9

Issued June 1962

SOIL SURVEY

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Cullman County will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing wood-

tion "Use and Management of Soils." In this way, they first identify the soils on their farm or ranch and then learn how these soils can be managed and what yields can be expected. The "Guide for Mapping Units" at the back of the report will simplify use of the map and the report. This guide lists, according to the

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SOIL SURVEY OF CULLMAN COUNTY, ALABAMA

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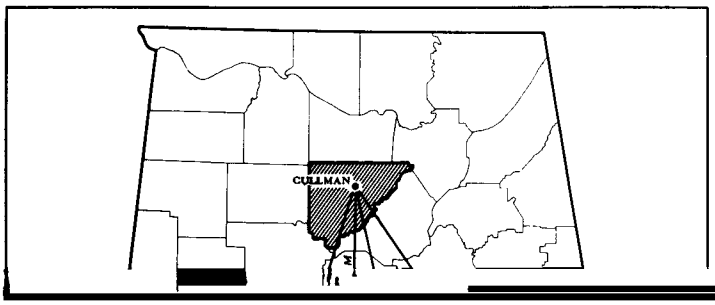
REPORT BY R. B. McNUTT AND E. A. PERRY

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE ALABAMA AGRICULTURAL EXPERIMENT STATION AND THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

CULLMAN COUNTY, in an area where the climate is generally mild and humid, has been primarily agricultural since early settlement. Corn, cotton, potatoes, sweet peppers, and strawberries are the main crops. Poultry is raised on many farms, and many broilers and eggs are produced. Beef cattle and hogs are the principal livestock, but some dairy cattle are raised in small commercial herds.



General Nature of the Area

Cullman County, in the north-central part of Alabama (fig. 1), has a total area of 743 square miles, or 475,520 acres. Smith Lake makes up about 8,040 acres of this area. Cullman, the county seat, is near the center of the county. The Mulberry Fork of the Black Warrior River is the southern and eastern boundary and separates the county from Blount County. The Sipsey Fork of the Black Warrior River is the southwestern boundary and separates the county from Walker County. The county is bounded on the west by Winston County, on the north by Morgan County, and on the northeastern corner by Marshall County.

Physiography

This county lies almost entirely in the Appalachian Plateau province (5). It is an area called the sandstone

up the parent material of most of the soils in the county. The beds of shale and sandstone are in two areas. The smaller area is the Warrior field in the extreme southwestern part of the county. The Plateau field covers nearly all the rest of the county. Strip mining for coal is important in the Warrior field.

Bangor limestone is in a small area in the north-central part of the county, adjacent to Morgan County. Outcrops of this limestone are exposed in the cuts of U.S. Highway No. 31, along the lower part of the steep slopes that break off at the edge of the valley. Bangor limestone is the parent rock of Rockland, limestone.

Drainage and Water Supply

Bernard College, Cullman County, Alabama

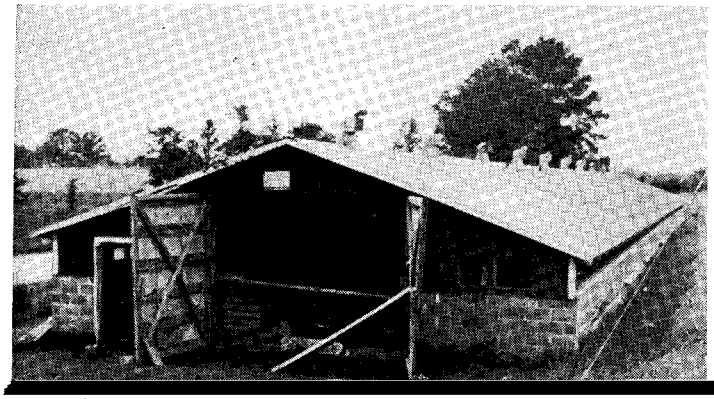
[Elevation, 802 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1943)	Wettest year (1929)	Average snowfall
	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
December	44.0	80	−4	5.53	3.13	4.39	0.5
January	43.1	79	−17	5.51	2.60	8.39	1.1
February	45.7	80	−7	4.92	2.69	4.70	.4

fox, bobcat, skunk, and weasel are the most common fur-bearing and predatory animals. The game in the county

Community Facilities

The total enrollment of all schools in the county is



Other products important in the diversified agriculture of this county are pork, beef, and milk. Large amounts of forest products are produced and are marketed through local dealers in lumber and pulpwood. About 240,704 acres in the county is woodland.

In 1954, there were 6,291 farms in the county with a total farm acreage of 374,812. Of this acreage, 169,679 acres was cropland. The average-sized farm was 59.6 acres, and tenants operated 26.4 percent of the farms. The 1954 Census of Agriculture lists the number of farms by type in this county as follows:

Type of farm	*Number of farms*
Field-crop farms (other than vegetable and fruit-and-nut)	3,575

The four soil associations, or general soil areas, in Cullman County are shown on the colored map at the back of this report. These associations are described in the following paragraphs.

Tilsit-Hartsells-Albertville Association

Well drained to moderately well drained soils, underlain by sandstone and shale, on level to rolling parts of the plateau

This soil association, or general soil area, is on the broad, nearly level to rolling Appalachian plateau. It makes up about 32 percent of the county. The area is dissected by a dendritic pattern of drainageways. Dominant in the association are the Tilsit, Hartsells, and Albertville soils (fig. 4). These soils formed in residuum of weathered sandstone and shale. Their depth to bedrock in most places ranges from 20 to 48 inches. Most of the area is east of U.S. Highway No. 31.

The Tilsit soils are on the broad, nearly level to gently sloping ridgetops. They are moderately well drained and have a fine sandy loam or loam surface soil and a yellowish-brown to dark yellowish-brown loam subsoil. A well-developed fragipan is at a depth of 20 to 26 inches. The Hartsells and Albertville soils are well drained and are generally more rolling than the Tilsit soils. They do not have a fragipan. The Albertville soils have a yellowish-brown to strong-brown, firm silty clay loam to silty clay subsoil, and the Hartsells soils have a friable loam to fine sandy clay loam subsoil.

Also in this association are the Muskingum, Philo, Stendal, and Atkins soils. The Muskingum soils are on the steep slopes along drainageways. They are shallow to bedrock, stony, and excessively drained. The Philo, Stendal, and Atkins soils are in recent local alluvium that is around the heads of and along the upper parts of the narrow drainageways. The Philo soils are moderately well drained; the Stendal soils, somewhat poorly drained; and the Atkins soils, poorly drained.

The Tilsit soils make up about 27 percent of the association; the Hartsells soils, 26 percent; the Albertville soils, 22 percent; and the Muskingum soils, 20 percent. The remaining 5 percent is Philo, Stendal, and Atkins soils.

About 80 percent of the association has been cleared. Of this acreage, at least 65 percent is made up of soils in capability classes II and III and most of this is cultivated. The remaining cleared area is in about equal acreages of class IV, VI, and VII soils.

This is the most intensively farmed area in the county. Most of the farms are operated by their owners and are small, well managed, and productive. Farming is a full-time operation. Most of the farms are of the general type, though there are a few small dairy and beef farms. Cotton, corn, truck crops, and nursery stock are the main crops. Broiler production is extensive.

Hartsells-Albertville-Linker-Muskingum Association

Well-drained to excessively drained soils, underlain by sandstone and shale, on gently sloping to hilly parts of the plateau

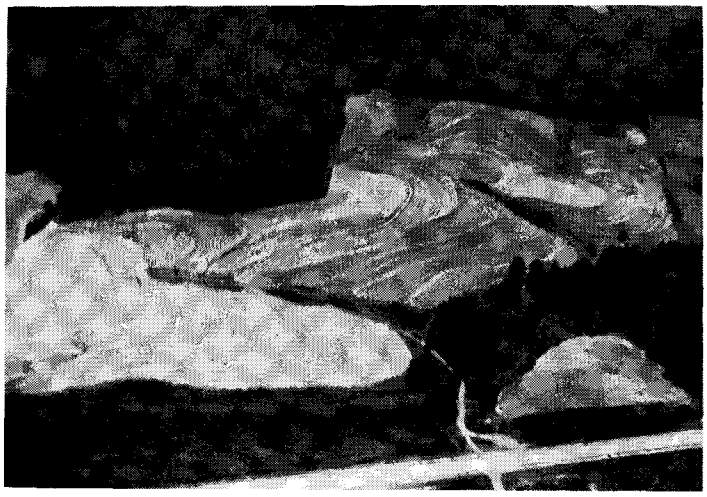


***Figure 4.*—Typical landscape in the Tilsit-Hartsells-Albertville soil association. Areas tilled on contour consist of Hartsells fine sandy loam, 6 to 10 percent slopes, eroded, and Tilsit fine sandy loam, 2 to 6 percent slopes, eroded. Waterways (dark strips) are on Philo and Stendal soils, local alluvium, and are planted to sericea lespedeza. Muskingum stony fine sandy loam, 15 to 45 percent slopes, is the dominant soil in the wooded areas.**

This soil association, which makes up about 32 percent of the county, is on the broad, gently sloping to hilly Appalachian plateau. The area is dissected by many streams. Dominant in the association are the Hartsells, Linker, Muskingum, and Albertville soils. These soils formed in residuum of weathered sandstone and shale. Their depth to bedrock in most places ranges from 20 to 40 inches. Most of this association is in the northwestern quarter of the county, but a small area extends southward along U.S. Highway No. 31 to the Mulberry Fork of the Black Warrior River at Garden City.

The Hartsells and Linker soils are on gently sloping to sloping ridgetops. These soils are well drained and formed in material weathered mostly from sandstone but partly from shale. They have a fine sandy loam surface soil. The subsoil of the Hartsells soils is yellowish-brown loam to fine sandy clay loam, whereas that of the Linker soils is yellowish-red to dark-red clay loam to fine sandy clay loam.

The Albertville soils are well drained and formed in residuum weathered mostly from acid shale but partly from sandy shale and sandstone. They are on rolling to hilly ridges. They have a loam or fine sandy loam surface soil and a firm, yellowish-brown to strong-brown silty clay loam to silty clay subsoil. The Muskingum soils are on steep slopes along the drainageways. In most places they are stony, shallow to bedrock, and excessively drained.

Also in this association are Tilsit, Johnsburg, Hanceville, Philo, Stendal, and Atkins soils. The Tilsit soils are on gently sloping ridgetops. They are moderately well drained and have a fine sandy loam or loam surface soil and a yellowish-brown to dark yellowish-brown loam subsoil. A well-developed fragipan is at a depth ranging from 20 to 26 inches. The Johnsburg soils are on low saddles and divides and around the heads of draws. They are somewhat poorly drained and have a loam sur-

face soil and a mottled silty clay loam subsoil. A fragipan is at a depth of 18 to 24 inches.

The Hanceville soils make up only a small acreage but are very productive. They are deep to very deep and well drained. Hanceville soils formed in residuum weathered mostly from sandstone but partly from shale. These soils are gently sloping to sloping. They occur mainly between Hanceville and Phelan, but a small area is near Goodhope School. These are the reddest soils in the county. Their surface soil is dark reddish-brown to dark-brown loam, and their subsoil is dark-red to red clay loam or fine sandy clay loam.

The Philo, Stendal, and Atkins soils are in recent local alluvium around the heads of and along the many nar-

layer and a well-developed fragipan at a depth of 18 to 24 inches. The Monongahela soils are moderately well drained, and the Tyler, somewhat poorly drained. The Pope soils are deep and well drained. They are in general alluvium on narrow flood plains and are subject to periodic flooding. Their surface layer is dark-brown to dark grayish-brown fine sandy loam, and their subsurface layers are dark-brown fine sandy loam.

Also in this association are the Sequatchie and the Purdy soils. These soils are on low stream terraces. The Sequatchie soils are well drained, and the Purdy soils are poorly drained. The Sequatchie soils have a dark-brown to dark yellowish-brown silt loam surface soil and a

the soil name. The word "eroded" is a part of the name of soils that have had 25 to 75 percent of the surface soil removed. The term "severely eroded" is part of the name of soils that have had more than 75 percent of the surface soil removed.

In their survey, the soil scientists may find, together in an area, two or more soils that are much alike and that require similar management. These soils may be mapped as a single mapping unit if the needs of the survey do not require that they be mapped separately. In Cullman County, an Enders silty clay loam and an Albertville silty clay loam were mapped together in a single mapping unit called Enders and Albertville silty clay loams, shallow, 6 to 10 percent slopes, severely eroded.

The scientists may also come across areas that have little true soil, or areas that are so inaccessible that an orderly examination is not practical. These areas may be rocky, gullied, or have little soil for other reasons. They are called miscellaneous land types and may be given a name descriptive of the land instead of a place name as is given to a soil series. Some of the land types mapped in Cullman County are Gullied land; Made land; Rockland, limestone; and Sandy alluvial land.

After the soil scientist determines the boundaries for the mapping units, he maps these boundaries on aerial photographs. He also designates important natural and manmade features that cannot be seen on the aerial photograph. When the field survey is completed, the photographs are sent to cartographers, who make a finished map like the one at the back of this report.

Descriptions of Soils

This section provides detailed information about the soils of Cullman County. It describes the soil series, or groups of soils, that have essentially the same kind of parent material and the single soils, or mapping units, that are shown on the detailed map at the back of this report.

The soil series are arranged in alphabetic order, and first described for each series are characteristics that are common to all the soils in the series. Then the single soils,

part of the A horizon, not more than 8 inches thick, is sometimes called the surface soil. The A horizon may be divided into A_1, A_2, and A_3 horizons.

The B horizon is the layer or layers in which some of the clays and minerals leached from the A horizon have accumulated. This horizon is sometimes divided into B_1, B_2, and B_3 horizons. The B horizon is frequently referred to as *subsoil.*

Below the B horizon in many soils, there is a C horizon, or parent material. A C_{ca} horizon has formed in the upper part of the C horizon in many soils that have developed from material containing free lime.

The D horizon underlies the C horizon, or the B if no C horizon is present. The designation D_r is for consolidated parent rock like that from which the parent material formed. In this county, the Atkins, Albertville, Hanceville, and many other soils have a D_r horizon.

The *color* of a soil horizon is denoted by words, such as "grayish brown," and by Munsell notations, such as "10YR 5/2." Munsell notations indicate colors more precisely than words and are used mainly by soil scientists and others who must make detailed comparisons of soils (*8*). In this report, the color given in words is the color of the soil when moist.

The color of the surface soil is generally related to the amount of organic matter in the soil material. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots or mottles of gray, yellow, red, or brown in the subsoil layers indicate poor drainage and restricted aeration. Uniform color of brown, yellow, and red normally indicates good drainage and good aeration.

The *texture* of the soil estimated in the field may be checked later in a soils laboratory. A fine sand is at least 85 percent sand; it is loose and friable when wet or dry. A clay is never more than 45 percent sand and is always more than 35 percent clay; it is sticky and plastic when wet and is hard when dry. Between sand and clay are other textures, for example, *clay loam, fine sandy loam,* and *sandy clay loam.*

The *structure* of a soil is the arrangement of the soil

TABLE 4.—*Approximate acreage and proportionate extent of soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*

lighter colored in the subsoil than the Enders soils and are deeper to bedrock than the Pottsville soils. Albertville soils less than 18 inches deep to rock are mapped in undifferentiated units of shallow Enders and Albertville soils.

The Albertville soils are low in natural fertility and in organic matter. They are strongly acid to very strongly acid. Infiltration of water is medium, and the permeability of the subsoil is moderate to slow. The moisture-supplying capacity is moderate to low. Because of the fine-textured subsoil, erosion is moderate to severe. Most areas, except severely eroded ones, are in good tilth.

face runoff and infiltration of water are medium. The permeability in the subsoil is moderate to slow. The moisture-supplying capacity and hazard of erosion are moderate.

Almost all of this soil is cultivated. Because it is on gentle slopes, is in good tilth, and responds well to management, this is one of the best soils in the county for intensive use. *Capability unit IIe-7; woodland suitability group 3A.*

Albertville loam, 2 to 6 percent slopes (AbB).—This soil is 1 to 3 inches thicker in the surface layer than Albertville loam, 2 to 6 percent slopes, eroded. To a

This soil is in fair to poor tilth and is moderate to low in moisture-supplying capacity. Surface runoff is medium to rapid, and the hazard of erosion is severe. Because of these unfavorable characteristics, this soil is not so well suited to cultivation as Albertville loam, 2 to 6 percent slopes, eroded.

All of this soil has been cleared, but small areas are reverting to forest, consisting mainly of loblolly pine. *Capability unit IIIe-7; woodland suitability group 5B.*

Albertville silty clay loam, 6 to 10 percent slopes, severely eroded (AcC3).—The plow layer of this soil is yellowish-brown silty clay loam, 4 to 6 inches thick. The combined depth of the plow layer and subsoil is slightly less than that of Albertville loam, 2 to 6 percent slopes,

[redacted]

is in trees or pasture, and these are suitable uses for these soils. Small acreages are idle or are in cultivated crops.

Only one soil in the Atkins series is mapped in Cullman County.

Atkins silt loam, local alluvium (0 to 2 percent slopes) (At).—This is a poorly drained, deep, friable soil that is forming in recent local alluvium at the heads of and along narrow drainageways.

Profile in a moist pasture 2.5 miles south of Holly Pond (NE¼SW¼ sec. 26, T. 10 S., R. 1 W.):

A_{1p} 0 to 14 inches, grayish-brown (10YR 5/2) to dark grayish-brown (10YR 4/2) silt loam with common, fine, distinct mottles of yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6); weak, fine, granular structure; friable; many fine roots; few small black

[redacted]

are on the surface and through the profile in various amounts.

Most of the Enders soils in this county are in the southwestern part. They occur with the Albertville, Pottsville, and Linker soils, and to a lesser extent, with the Hanceville

the subsoil is slow. The moisture-supplying capacity is moderate to low. This soil is in good tilth and responds well to management. The hazard of erosion is moderate.

Almost all of this soil is planted to corn, cotton, truck crops, hay, and pasture. *Capability unit IIe–7; wood-*

Profile of a shallow Albertville soil 9.0 miles southwest of Cullman (NW¼SE¼ sec. 23, T. 11 S., R. 4 W.):

- A_p 0 to 6 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, fine, crumb structure; very friable; many fine roots; very strongly acid; clear, smooth boundary. 3 to 8 inches thick.
- B_1 6 to 10 inches, yellowish-brown (10YR 5/4) loam or light fine sandy clay loam; weak, medium, subangular blocky structure; friable; many fine roots; few fragments of shale and sandstone, ⅛ to ½ inch in diameter; very strongly acid; gradual, wavy boundary. 2 to 6 inches thick.
- B_2 10 to 15 inches, yellowish-brown (10YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; 15 to 20 percent of volume consists of fragments of shale and sandstone, ⅛ to ½ inch in diameter; few clay skins; very strongly acid; gradual, wavy boundary. 4 to 12 inches thick.
- C 15 to 20 inches, yellowish-brown, strong-brown, and yellowish-red partly weathered shaly silty clay loam; 40 to 50 percent of volume consists of fragments of shale and sandstone.
- D_r 20 inches, interbedded shale and sandstone.

Angular fragments of shale and sandstone, ⅛ to ½ inch in diameter, are common on and in this soil. The surface soil ranges from fine sandy loam to silt loam in texture

slope, shallow depth, erosion, and the low moisture-supplying capacity. Many areas are now idle or are reverting to woodland, mainly to loblolly, shortleaf, and Virginia pine. *Capability unit IVe–9; woodland suitability group 4B.*

Enders and Albertville soils, shallow, 10 to 15 percent slopes (EsD).—The surface layer of this mapping unit is 1 to 3 inches thicker than that of Enders and Albertville soils, shallow, 2 to 6 percent slopes, eroded. The upper 1 to 2 inches is dark grayish brown to very dark grayish brown instead of dark yellowish brown.

Surface runoff is medium to rapid, infiltration of water is medium, and the moisture-supplying capacity is low. The hazard of erosion is severe.

Most of the acreage of this mapping unit has not been cleared and is in forest, consisting mainly of oak, hickory, and pine. It is not generally suited to cultivation. *Capability unit VIe–4; woodland suitability group 4B.*

Enders and Albertville soils, shallow, 10 to 15 percent slopes, eroded (EsD2).—This mapping unit is 1 to 2 inches thinner in the surface soil than Enders and Albertville soils, shallow, 2 to 6 percent slopes, eroded.

low. The hazard of erosion is severe. Tilth is generally poor.

All of the acreage in these strongly sloping soils has been cleared and cropped, but the soils are not suited to cultivation. Most of the acreage is now idle or is reverting to woodland, mainly to loblolly, shortleaf, and Virginia pine. These trees are well suited. *Capability unit VIIe-2; woodland suitability group 7.*

Gullied Land

moderate. The moisture-supplying capacity is moderate to high. Though most areas are in good to very good tilth, the hazard of erosion is moderate to severe.

The native vegetation consists of oak, hickory, and pine, but almost all the acreage in Hanceville soils has been cleared. These soils are cultivated intensively and are well suited to crops. They respond well to management and are among the most productive soils in the county.

Hanceville loam, 2 to 6 percent slopes, eroded (HgB2).—This is a very deep, well-drained, red soil. It

bedrock ranges from 40 to 65 inches. The moisture-supplying capacity is moderate to high; the hazard of erosion is moderate to severe.

Most of this soil has been cleared and is cropped. It is suited to moderately intensive cultivation. (*Capability unit IIIe–2; woodland suitability group 4B.*)

Hartsells Series

The Hartsells series consists of shallow to moderately deep, well-drained soils that are gently sloping or sloping in most places. These soils developed mainly in residuum weathered from sandstone that is interbedded, in places, with thin lenses of shale. The depth to bedrock ranges from about 12 to 60 inches.

In most places, the Hartsells soils have a grayish-brown to light olive-brown fine sandy loam surface soil and a yellowish-brown loam to fine sandy clay loam subsoil.

The Hartsells soils are widely distributed in this county. These soils are moderately deep in about two-thirds of the acreage. In the rest of the acreage they are 18 inches or less deep to bedrock. The shallow Hartsells soils are gently sloping to strongly sloping, and the moderately

B_2 10 to 26 inches, yellowish-brown (10YR 5/6) loam; weak, medium, subangular blocky structure; friable; few fine roots; strongly acid; clear, smooth boundary. 10 to 20 inches thick.

B_3 or C 26 to 48 inches +, mottled yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), dark-brown (7.5YR 4/4), and strong-brown (7.5YR 5/6) fine sandy clay loam; moderate, medium to coarse, angular and subangular blocky structure; friable; few fine roots; many peds coated with dark brown (7.5YR 4/4); few fragments of sandstone, ⅛ to ¼ inch in diameter; strongly acid.

The surface soil is light yellowish brown to dark brown fine sandy loam. The subsoil ranges from yellowish brown to strong brown in color and from loam to fine sandy clay loam in texture. In places, a B_1 horizon has not formed. Included with this soil are a few gravelly areas.

This soil is low in natural fertility and in organic matter. It is strongly acid. Surface runoff and the infiltration of water are medium. The permeability is moderate, and the moisture-supplying capacity is moderately high. This soil is in good tilth and responds well to management.

Most of this soil is cultivated and can be cropped intensively. Good

itat unit IIIe-9; woodland suitability group 5A

face layer is grayish brown to light yellowish brown fine

Profile in a moist, wooded area that was formerly cultivated, 4.5 miles west of Hanceville (NW¼NE¼ sec. 28, T. 11 S., R. 3 W):

- A_p 0 to 6 inches, yellowish-brown (10YR 5/4–5/6) fine sandy loam; weak, fine, granular structure; very friable; few fragments of sandstone, ⅛ to ¼ inch in diameter; many fine roots; very strongly acid; abrupt, smooth boundary. 4 to 10 inches thick.
- A_3 6 to 12 inches, yellowish-brown (10YR 5/4) to dark yellowish-brown (10YR 4/4) fine sandy loam; weak, fine, granular and subangular blocky structure; very friable; few fragments of sandstone, ⅛ to ¼ inch in diameter; many fine roots; strongly acid; abrupt, smooth boundary. 4 to 8 inches thick.
- B_1 12 to 23 inches, yellowish-brown (10YR 5/8) light fine sandy clay loam or loam; friable; few concretions of sandstone and manganese, ⅛ to ¼ inch in diameter; many fine roots; very strongly acid; clear, wavy boundary. 6 to 15 inches thick.
- B_2 23 to 33 inches, strong-brown (7.5YR 5/6–5/8) fine sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; few to many fragments of sandstone, ⅛ to ¼ inch in diameter; few fine roots; very strongly acid; clear, wavy boundary. 6 to 15 inches thick.
- B_3 33 to 42 inches, mottled pale-yellow (2.5Y 7/4), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/6) light fine sandy clay loam; moderate, medium, subangular blocky structure; friable.

In most places, the surface soil is yellowish-brown to dark yellowish-brown fine sandy loam. The subsoil generally ranges from yellowish brown to strong brown.

Included with this soil are areas with a surface soil of grayish-brown to dark grayish-brown sandy loam and loam. Also included are some gravelly areas and small areas that have a yellowish-red to red subsoil.

This soil is low in natural fertility and contains little organic matter. It is strongly acid to very strongly acid. Surface runoff is medium, permeability in the subsoil is moderate, and the moisture-supplying capacity is moderate. This soil is in good tilth and responds well to management, but the hazard of erosion is moderate. *Capability unit IIIe–2; woodland suitability group 5A.*

Jefferson fine sandy loam, 2 to 6 percent slopes, eroded (JeB2).—This soil is less strongly sloping than Jefferson fine sandy loam, 6 to 10 percent slopes, eroded.

Most of this soil has been cleared and is cultivated. Some areas are in pasture, and some are reverting to trees, mainly to loblolly pine. The soil is suited to intensive cultivation because it has gentle slopes, a fairly thick root zone, and moderate moisture-supplying capacity. It is in good tilth. The hazard of erosion, however, is moderate. *Capability unit IIe–2; woodland suitability group 5A.*

Jefferson fine sandy loam, 10 to 15 percent slopes, eroded (JeD2).—This soil is more strongly sloping than Jefferson fine sandy loam, 6 to 10 percent slopes, eroded. Surface runoff is medium to rapid, and the hazard of erosion is severe.

Most of this soil has been cleared and cultivated, but many of the cleared areas have reverted to fair to good stands of loblolly pine. A few small areas are idle or are in pasture. This soil is best suited to pasture or trees, but it can be cultivated at long intervals if it is carefully managed. *Capability unit IVe–2; woodland suitability group 5A.*

Johnsburg Series

The Johnsburg series consists of moderately deep, somewhat poorly drained soils with a fragipan. These soils are on very gentle slopes and in low saddles or divides as well as in nearly level areas around the heads of drains. In most places they formed in material weathered from interbedded layers of sandstone and shale, but in some places they formed in material washed or sloughed from soils underlain by sandstone and shale.

In most places, the Johnsburg soils have a brown to light yellowish-brown loam surface soil and a yellowish-brown loam to silty clay loam subsoil. The subsoil is prominently mottled with gray and brown. The fragipan is in the lower part of the subsoil.

In this county, these soils are in small, scattered areas in the uplands, mainly in the central and western parts. Few areas are larger than 3 acres. They are in narrow bands or strips that are generally bordered by Tilsit, Hartsells, and Albertville soils on one side and, on the other side, by the local alluvium phases of the Philo, Stendal, and Atkins soils. Johnsburg soils are more poorly drained than the Tilsit, Hartsells, Albertville, and Philo soils but are better drained than the Atkins soils and are about equal in drainage to the Stendal soils. They generally are finer textured than the Philo, Stendal, and Atkins soils, which do not have a well-developed B horizon.

The Johnsburg soils are low in natural fertility and in organic matter. They are medium acid to very strongly acid. Surface runoff is slow, infiltration of water is medium, and permeability in the subsoil is moderate to slow. These soils are generally low in productivity, but they respond well to management.

The native vegetation is oak, hickory, gum, maple, and poplar. About two-thirds of the acreage has been cleared and is mostly in pasture. A small acreage is cultivated.

Only one soil in the Johnsburg series is mapped in Cullman County.

Johnsburg loam (0 to 2 percent slopes) (Jo).—This is a moderately deep, somewhat poorly drained soil. It developed on nearly flat uplands in material weathered from interbedded sandstone and shale.

Profile in a moist pasture 2.0 miles north of Cullman and slightly east of the Louisville and Nashville Railroad (SE¼NE¼ sec. 4, T. 10 S., R. 3 W.):

- A_1 0 to 2 inches, very dark gray (2.5Y N 3/0) loam; weak, fine, granular structure; friable; many fine roots; strongly acid; clear, wavy boundary. 0 to 4 inches thick.
- A_2 2 to 8 inches, mottled light yellowish-brown (2.5Y 6/4) and light olive-brown (2.5Y 5/4) loam; mottles are common, fine, and faint; weak, fine to medium, subangular blocky and weak, fine, granular structure; friable; few fine roots; very strongly acid; gradual, wavy boundary. 4 to 8 inches thick.
- B_{21} 8 to 16 inches, mottled pale-yellow (2.5Y 7/4) and light yellowish-brown (2.5Y 6/4) loam; mottles are many, fine, and faint; weak to moderate, fine to medium, subangular blocky structure; friable; few fine roots; few small, partly weathered fragments of sandstone, ⅛ to ¼ inch in diameter; very strongly acid; gradual, wavy boundary. 6 to 12 inches thick.
- B_{22} 16 to 22 inches, mottled light brownish-gray (2.5Y 6/2), pale-yellow (2.5Y 7/4), brownish-yellow (10YR 6/6), and reddish-yellow (7.5YR 6/6) light clay loam; mottles are many, medium, and faint; weak to moderate, medium, subangular blocky structure; friable;

few small, partly weathered fragments of sandstone, ¼ to ½ inch in diameter; strongly acid; gradual, wavy boundary. 4 to 10 inches thick.

B_{3m} 22 to 33 inches, mottled light yellowish-brown (2.5Y 6/4)

Much of the acreage of these soils has been cleared and is in crops, a use to which it is well suited. Some areas are reverting to trees, mainly to loblolly pine. The Lead-

Slopes of 6 to 10 percent are dominant. These soils developed in residuum weathered mostly from sandstone but partly from interbedded shale.

In most places, the surface layer of these soils is dark grayish-brown to yellowish-brown fine sandy loam. The subsoil is yellowish-red to dark-red clay loam to fine sandy clay loam.

In this county, the Linker soils are widely distributed in a large total acreage. Most of the acreage is in the western half of the county. In most places, Linker soils adjoin the Hartsells and Tilsit soils; in some places, they adjoin the Enders and Hanceville soils. The Linker soils are redder in the subsoil than the Hartsells and the Tilsit soils and lack the fragipan formed in the Tilsit soils. Linker soils have a coarser textured subsoil than the Enders soils and a lighter colored surface layer than the Hanceville soils.

The Linker soils are low in natural fertility and in organic matter. They are medium acid to strongly acid. Infiltration of water is medium to slow, and permeability in the subsoil is moderate. Except in severely eroded areas, these soils are in good tilth, but the hazard of erosion is moderate to severe.

The native vegetation consists of oak, pine, and hickory, but much of the acreage is being reforested to loblolly pine. The uneroded, gently sloping Linker soils are among the best soils in the county for intensive cropping. Corn, cotton, truck crops, hay, and pasture are well suited. Response to management is good.

[redacted]

yellowish-red to dark-red loam to clay loam. In most places, the depth to the parent material is 24 to 36 inches or more. Small fragments of sandstone and shale are common on and in the soil, but they are abundant in only a few isolated areas. Included with this soil are small areas that have a loam and sandy loam surface soil.

This soil is low in natural fertility and in organic matter. It is medium acid to strongly acid. Surface runoff is medium, permeability in the subsoil is moderate, and the hazard of erosion is moderate. The moisture-supplying capacity is moderate to high. This soil is in good tilth and responds well to management. It is well suited to intensive cultivation. *Capability unit IIe–2; woodland suitability group 5A.*

Linker fine sandy loam, 2 to 6 percent slopes, eroded (lkB2).—This soil is thinner and lighter colored in the surface layer than Linker fine sandy loam, 2 to 6 percent slopes. Its plow layer is brown to light yellowish-brown fine sandy loam, 5 to 7 inches thick. The subsoil is yellowish-red to dark-red clay loam to fine sandy clay loam.

Most of this soil has been cleared and is in crops. It is suited to intensive cultivation because it is in good tilth and has gentle slopes, a fairly thick root zone, and moderate moisture-supplying capacity. The hazard of erosion, however, is moderate. *Capability unit IIe–2; woodland suitability group 5A.*

Linker fine sandy loam, 6 to 10 percent slopes (lkC).—In most places, this soil is less deep to the parent material than Linker fine sandy loam, 2 to 6 percent slopes. Sur-

tivated. *Capability unit IVe–2; woodland suitability group 7.*

Linker fine sandy loam, 10 to 15 percent slopes (lkD).—In most places, this soil is less deep to the parent material than Linker fine sandy loam, 2 to 6 percent slopes. Surface runoff is medium to rapid, the moisture-supplying capacity is moderate, and the hazard of erosion is moderate to severe.

The native vegetation on this soil is oak, hickory, and pine forest. Most of the soil has not been cleared.

cuts remain where seams of coal have been removed through strip mining.

Revegetation is difficult on this land because of the steep, uneven placement of the soil material. The hazard of erosion is severe, and the moisture-supplying capacity is poor. This land is not suited to any agricultural use. *Capability unit VIIe–1; woodland suitability group 8.*

Monongahela Series

The Monongahela series consists of moderately deep

and Leadvale soils. A fragipan has not formed as it has in the Leadvale soils. Muse soils are similar to the Albertville and Enders soils, which developed in residuum instead of in old alluvium.

The Muse soils are low in natural fertility and in organic matter. They are medium acid to very strongly

cause slopes are strong and erosion is a hazard. *Capability unit IVe–7; woodland suitability group 3A.*

Muse shaly silt loam, 2 to 6 percent slopes, eroded

strongly acid; clear, wavy boundary. 4 to 6 inches thick.

BC 8 to 12 inches, yellowish-brown (10YR 5/6) stony fine sandy loam; weak, fine, granular and some weak,

after a heavy rain or a flood, water stands on these soils for 1 to 5 days. Infiltration of water is medium, and permeability in the subsurface layers is moderate. The moisture-supplying capacity is high. These soils are in good tilth and respond well to management.

so indistinct that it is not practical to map them separately on the soil map. These soils are widely distributed. They consist of recent local alluvium that has washed from adjacent higher lying areas that are underlain by sandstone and shale. The Bibb soils are moderately well

surface and, in some areas, the soils are covered with water for several days. Seepage is a problem.

These soils are widely distributed in the county, and about half of the acreage is in crops or in pasture. Where adequately drained and protected from the runoff of adjacent higher areas, these soils are suited to moderately intensive use. *Capability unit IIIw-2; woodland suitability group 2A.*

Pope Series

The Pope series consists of deep, well-drained, level to nearly level soils. These soils are developing in general alluvium that washed mainly from soils on weathered sandstone and shale. Along the Mulberry Fork of the Black Warrior River, however, some of the alluvium washed from soils formed in weathered sediments of limestone.

vesicles and some worm casts; a few mottles of light brownish-gray and light yellowish-brown (2.5Y 6/4) silt loam; gray color increases with depth.

The surface soil ranges from dark brown to dark grayish brown, and in some places, the subsurface layers are yellowish brown. Thin lenses of loamy fine sand are at various depths in some areas. Along many narrow tributaries, fragments of waterworn sandstone and shale are on the surface and in the soil. Included with this soil are areas in which the surface soil and subsurface layers are silt loam or loam.

Surface runoff is slow, permeability is moderate to rapid, and the moisture-supplying capacity is high. The soil is medium in natural fertility and low to medium in organic matter. It is medium acid to strongly acid.

This soil is well suited to intensive use because it is in good tilth and has a thick root zone, good moisture content, and nearly level slopes. Overflow, however, is a

medium acid; clear, smooth boundary. 3 to 6 inches thick.

AC, 5 to 9 inches, yellowish-brown (10YR 5/4, 5/6) shaly

is a small area that has a well-developed, yellowish-brown to yellowish-red silty clay B horizon, 6 to 8 inches thick.

brown (10YR 5/6), and strong-brown (7.5YR 5/6) silty clay or clay; mottles are many, medium, and distinct; massive (structureless); firm; strongly acid.

D$_r$ 72 inches, bedrock of sandstone and shale.

The surface soil ranges from gray to light brownish

Sandy alluvial land is very low in fertility and in moisture-supplying capacity.

Included with this land type is a small acreage on nearly level slopes. The soils in these areas are deep and excessively drained. They have a distinct, very dark gravish-

ture; firm; few fine roots; medium acid; clear, wavy boundary. 18 to 24 inches thick.

B_3 31 to 36 inches, mottled yellowish-brown (10YR 5/8),

above the fragipan. The moisture-supplying capacity is moderate. Because the slopes are gentle, erosion is only slight to moderate hazard.

Figure 6.—**Pasture in Coastal bermudagrass on Tilsit fine sandy loam, 2 to 6 percent slopes. The average annual yield is 4 tons of hay per acre.**

that of Tilsit fine sandy loam, 2 to 6 percent slopes, eroded, and the supply of organic matter and the moisture-supplying capacity are greater.

Because the movement of water through this soil is

The Tyler soils are low in natural fertility and in organic matter. They are very strongly acid. Surface runoff is slow, infiltration of water is medium to slow, and permeability is moderate to slow. These soils are saturated in wet periods.

The native vegetation consists of gum, water oak, poplar, maple, beech, and pine. Almost all of the acreage is wooded, but some cleared areas are in pasture. A small acreage is in crops.

Only one soil in the Tyler series was mapped in Cullman County.

Tyler silt loam (0 to 2 percent slopes) (Ty).—This is a somewhat poorly drained, deep, medium-textured soil on low stream terraces. It contains a fragipan.

Profile in a moist, idle area 1.5 miles west of Hanceville (SE¼NW¼ sec. 30, T. 11 S., R. 2 W.):

A_p 0 to 9 inches, yellowish-brown (10YR 5/4) silt loam; common, fine, distinct mottles of pale brown (10YR 6/3) and strong brown (7.5YR 5/6); weak, fine, granular structure; friable; many fine roots; very strongly acid; clear, smooth boundary. 6 to 10 inches thick.

A_3 9 to 11 inches, mottled light brownish-gray (10YR 6/2), brown (10YR 5/3), and grayish-brown (2.5Y 5/2) silt loam; mottles are common, fine, and distinct; weak, fine, granular structure; friable; many fine roots; very strongly acid; abrupt, smooth boundary

and low in dry periods. During rainy periods this soil becomes saturated or waterlogged, and water stands on

signed locally, for example, IIe–2 or IIIe–2. These numbers are not consecutive in Cullman County, because

textured soils with a fragipan on uplands, foot slopes, and stream terraces.

Class IV: Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe: Soils subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–2.—Moderately deep, well-drained, sloping to strongly sloping fine sandy loams; slight to severe erosion.

Capability unit IVe–7.—Moderately deep to deep, well-drained, sloping to strongly sloping loams, silt loams, and silty clay loams; moderate to severe erosion.

Capability unit IVe–9.—Shallow to very shallow, well-drained, gently sloping to sloping soils; moderate erosion.

Subclass IVw: Soils that have very severe limitations for cultivation because of excess water.

Capability unit IVw–2.—Deep, poorly drained alluvial soils in depressions on uplands and on stream terraces.

Class VI: Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture, woodland, or food and cover for wildlife.

Subclass VIe: Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIe–2.—Moderately deep, well-drained, loamy soils on uplands.

Capability unit VIe–4.—Shallow to very shallow, stony soils that are well drained to excessively drained.

Class VII: Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation, and that restrict their use largely to woodland, grazing, or wildlife.

Subclass VIIe: Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIIe–1.—Steep, stony, and excessively drained soil materials and land types

assistance on land preparation, cropping systems, terracing, drainage, pasture management, forestry, and other farm problems.

CAPABILITY UNIT I–2

Sequatchie silt loam, 0 to 2 percent slopes, is the only soil in this capability unit. This soil is on stream terraces and is moderately deep to deep, well drained, and friable. Its surface soil is silt loam, 6 to 8 inches thick. The subsoil is friable silt loam to silty clay loam.

Infiltration of water is medium, permeability is moderate, and the moisture-supplying capacity is moderately high. This soil contains little organic matter, is low in fertility, and is medium acid to strongly acid.

About two-thirds of this soil is cultivated. Suitable crops are cotton, corn, sorghums, soybeans, small grains, truck crops, and most legumes and grasses. Yields of pecans are high.

A good cropping system is 1 year of a small grain or a sod crop followed by 2 years of row crops. Row crops can be grown continuously if a cover crop is grown each year and, to maintain the supply of organic matter, all crop residue is returned to the soil.

For high yields of all crops and pasture plants, add large amounts of fertilizer to this soil. Yields of most legumes and of many row crops and grasses are increased by additions of lime.

Good tilth is easy to maintain; tillage can be done within a wide range of moisture content. To control runoff, provide a good cropping system and manage the crop residue well.

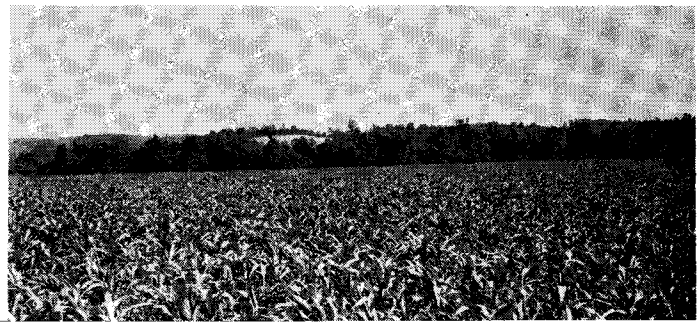
CAPABILITY UNIT IIe–2

This capability unit consists of moderately deep to deep, well-drained, friable soils that are medium textured to moderately coarse textured. These soils are gently sloping and occur on uplands, foot slopes, and stream terraces. Their root zone is thick; bedrock is at a depth greater than 30 inches. The surface layer is loam, silt loam, or fine sandy loam, 5 to 8 inches thick. The subsoil is friable

made seed. Return all crop residue to these soils to maintain the supply of organic matter.

For high yields of all crops and pasture plants, apply large amounts of fertilizer and increase the organic matter in the soils. Additions of lime increase the yields of most legumes and of many field crops, truck crops, and grasses. If alfalfa is grown, add boron.

These soils are easy to maintain in good tilth, and they can be tilled within a wide range of moisture content. To control runoff, till on the contour, build terraces, grass the waterways, and plant borders around the fields. Use a good cropping system, and manage the crop residue



silt loam, 6 to 7 inches thick. The subsoil is friable to firm heavy loam to silty clay.

Infiltration of water in these soils is medium, permeability is moderate to slow, and the moisture-supplying capacity is moderately high to low. The medium surface runoff causes a moderate erosion hazard. These soils are low in organic matter and in fertility and are medium acid to very strongly acid. They are:

Albertville loam, 2 to 6 percent slopes.
Albertville loam, 2 to 6 percent slopes, eroded.
Enders silt loam, 2 to 6 percent slopes, eroded.
Muse shaly silt loam, 2 to 6 percent slopes, eroded.

Almost two-thirds of the acreage in these soils is cultivated. Suitable crops are corn, cotton, small grains, sorghums, soybeans, truck crops, most grasses and legumes, peaches, and pecans.

A suitable cropping system consists of 1 or 2 years of a sod crop followed by 2 years of row crops. All crop residue should be left on these soils to maintain the supply of organic matter.

For all crops and pasture plants, add large amounts of fertilizer and maintain the supply of organic matter. These soils need to be limed before they are planted to most legumes. Many other crops also respond to lime.

Fragments of shale interfere somewhat with tillage. To control runoff, the more sloping areas of these soils need contour tillage, terraces, grassed waterways, and field borders. A good cropping system and intensive use of crop residue are needed on all slopes. These soils are suited to sprinkler irrigation.

CAPABILITY UNIT IIw-1

Pope fine sandy loam is the only soil in this capability unit. This soil is deep, well drained, friable, and moderately coarse textured. It is nearly level and is on first bottoms or flood plains that are periodically flooded. The surface soil is fine sandy loam, 4 to 8 inches thick. The subsurface layers are friable fine sandy loam and loam.

Infiltration of water in this soil is medium, permeability is moderate to rapid, and the moisture-supplying capacity is high. Surface runoff is slow. This soil is low to medium in organic matter, medium in fertility, and slightly acid to strongly acid.

Almost two-thirds of this soil is cultivated. Except for peaches, berries, and melons, all crops grown in the county are suited to this soil. Fescue and whiteclover are well suited.

A good cropping system consists of 1 year of a sod crop followed by 2 years of row crops. Row crops can be grown continuously if all crop residue is left on this soil and a winter cover crop is planted each year and plowed under in spring. Crop rotations, however, are better suited to this soil than continuous row crops. Apply moderately large amounts of fertilizer and increase the supply of organic matter.

Good tilth is easy to maintain, but excess moisture interferes somewhat with tillage and other fieldwork. Because slopes are gentle, runoff is not a serious hazard. Plant

CAPABILITY UNIT IIw-2

This capability unit consists of moderately deep, moderately well drained, friable soils that are medium textured to moderately coarse textured. These soils are on uplands and low stream terraces. At a depth of 18 to 24 inches is a fragipan, or compact layer, which retards the movement of roots, air, and moisture. The surface soil is fine sandy loam and loam, 6 to 8 inches thick. The subsoil is friable loam, silt loam, and clay loam.

Infiltration of water in these soils is medium, and runoff is slow. Above the fragipan, permeability is moderate. These soils have a moderate moisture-supplying capacity. They warm up slowly in spring and are somewhat droughty in dry periods. They contain little organic matter, are low in fertility, and are slightly acid to very strongly acid. These soils are:

Monongahela fine sandy loam, 0 to 2 percent slopes.
Tilsit loam, 0 to 2 percent slopes.

About two-thirds of the acreage in these soils is cultivated. Suitable crops are corn, cotton, small grains, sorghums, soybeans, truck crops, grasses, legumes, and pecans. Peaches are poorly suited.

A good cropping system consists of 1 or 2 years of a close-growing crop, such as Caley peas, followed by 2 years of row crops. Leave all crop residue on these soils to maintain the supply of organic matter.

For high yields of all crops and pasture plants, apply large amounts of fertilizer and increase the organic-matter content. Lime is needed for high yields of most legumes, and many other crops respond to lime.

These soils can be tilled within only a narrow range of moisture content. To control runoff, provide a good cropping system and use crop residue extensively.

These soils are suited to sprinkler and surface irrigation.

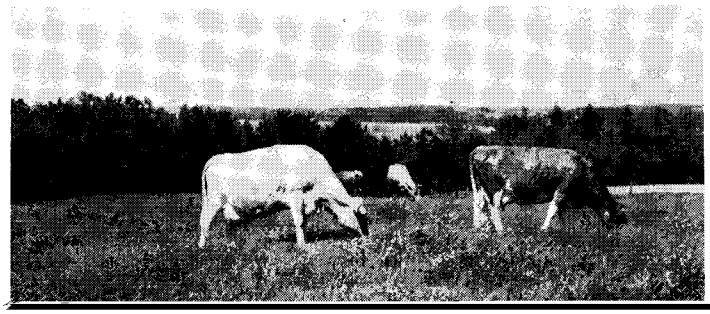
CAPABILITY UNIT IIIe-2

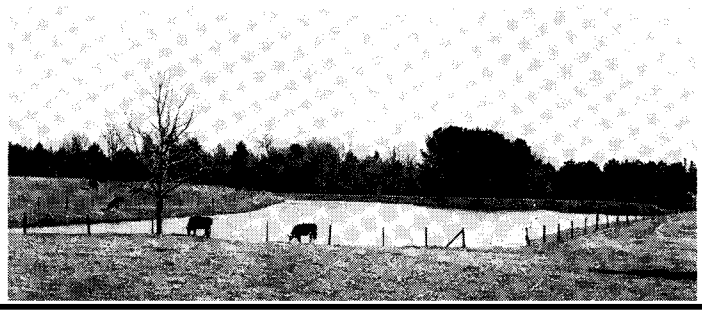
This capability unit consists of moderately deep, well-drained, friable soils that are medium textured to moderately course textured. These soils are on sloping uplands and foot slopes. They have a thick root zone; bedrock is at a depth greater than 30 inches. The surface soil is loam and fine sandy loam, 4 to 6 inches thick. The subsoil is friable loam, fine sandy clay loam, and clay loam.

Infiltration of water in these soils is medium, and the permeability and moisture-supplying capacity are moderate. Runoff is medium, and the hazard of erosion is moderate to severe. Organic matter is scarce, fertility is low, and the soils are medium acid to very strongly acid. The soils in this group are:

Hanceville loam, 6 to 10 percent slopes, eroded.
Hartsells fine sandy loam, 6 to 10 percent slopes.
Hartsells fine sandy loam, 6 to 10 percent slopes, eroded.
Jefferson fine sandy loam, 6 to 10 percent slopes, eroded.
Linker fine sandy loam, 6 to 10 percent slopes.
Linker fine sandy loam, 6 to 10 percent slopes, eroded.

Almost two-thirds of the acreage in these soils is cultivated. Suitable crops are cotton, corn, sorghums, soybeans, small grains, truck crops, most grasses and legumes (fig. 10), peaches, and pecans. Row crops can be grown in any of the following cropping systems: (a) 2 years





maintain organic matter. Tillage and other fieldwork are difficult when these soils are wet. Many areas need artificial drainage to reduce flooding and to dispose of excess water in rainy periods.

CAPABILITY UNIT IVe–2

This capability unit consists of moderately deep, well-drained, friable soils that are moderately coarse textured. These soils are sloping to strongly sloping and are on uplands and foot slopes. They have a moderately thick root zone; bedrock is at a depth greater than 24 inches. The soils in this group are:

Hartsells fine sandy loam, 6 to 10 percent slopes, severely eroded.
Jefferson fine sandy loam, 10 to 15 percent slopes, eroded.
Linker fine sandy loam, 6 to 10 percent slopes, severely eroded.
Linker fine sandy loam, 10 to 15 percent slopes.
Linker fine sandy loam, 10 to 15 percent slopes, eroded.

Except for the severely eroded soils in this group, the surface soil is friable to very friable fine sandy loam, 4 to 8 inches thick. The severely eroded soils have a surface layer of friable, heavy fine sandy loam, 3 to 6 inches thick. Their clayey subsoil material is exposed in places, and tilth is not so good as in the less eroded areas. The subsoil is friable loam, fine sandy clay loam, or clay loam. Shallow gullies are common in the severely eroded soils.

Infiltration of water in these soils is medium to slow, and the permeability and moisture-supplying capacity are moderate. Medium to rapid surface runoff causes a moderate to severe hazard of erosion. These soils are low in organic matter and in fertility and are medium acid to very strongly acid.

More than one-third of the acreage in these soils is cultivated. Suitable crops are cotton, corn, sorghums, soybeans, small grains, truck crops, most grasses and legumes, peaches, and pecans. A suitable cropping system consists of 3 or more years of perennial sod crops followed by 1 year of a row crop.

For all crops, these soils need large to very large amounts of fertilizer, lime, and organic matter. Be- fair to poor in tilth. The subsoil of the soils in this group is friable to firm, heavy loam to silty clay.

Infiltration of water is medium, permeability is moderate to slow, and the moisture-supplying capacity is moderately high to low. Rapid surface runoff causes a severe hazard of erosion. These soils are low in organic matter and in fertility and are medium acid to very strongly acid.

About one-third of the acreage in these soils is cultivated. The suitability for crops varies, but grasses and legumes grow best. Suited in some areas are corn, cotton, small grains, sorghums, soybeans, truck crops, peaches, and pecans. A suitable cropping system is 3 or more years of perennial sod crops followed by 1 year of a row crop.

Good tilth is difficult to maintain on these soils; tillage should be kept to a minimum. These soils need large to very large amounts of fertilizer, lime, and organic matter. To control runoff effectively, plant perennial sod crops and provide contour tillage, grassed waterways, field borders, and terraces. Stripcrop areas that are not suited to terraces, and build diversion ditches where needed.

CAPABILITY UNIT IVe–9

This capability unit consists of shallow to very shallow, well-drained soils on gently sloping to sloping uplands. These soils have a friable, medium-textured to moderately coarse textured surface soil and a thin or very thin subsoil. The surface soil is fine sandy loam, shaly fine sandy loam, or shaly silt loam and is 3 to 6 inches thick. The subsoil is friable to firm loam, silty clay loam, shaly silty clay loam, or silty clay. These soils have a thin to very thin root zone; depth to bedrock ranges from 8 to 20 inches.

Infiltration of water in these soils is medium, and permeability is moderate to slow. The moisture-supplying capacity is low to very low. Medium to rapid surface runoff causes a moderate to severe hazard of erosion. These soils are low in organic matter and in fertility and are medium acid to very strongly acid. They are:

distinctly mottled silt loam, 6 to 18 inches thick. The subsoil is distinctly to coarsely mottled silt loam to silty clay loam.

Infiltration of water in these soils is medium to slow, permeability is slow, and the moisture-supplying capacity is high. In many places after intensive rains or prolonged wet periods, water stands on these soils for long periods. The soils are low to medium in organic matter, medium to low in natural fertility, and are strongly acid to very strongly acid. The soils in this group are:

Atkins silt loam, local alluvium.
Purdy silt loam.

Almost half of the acreage in these soils is woodland or is idle cropland; only about one-fifth is cultivated. The remaining acreage is in pasture. The crops best suited to these soils are bahiagrass, orchardgrass, dallisgrass, fescue, whiteclover, Caley peas, annual lespedeza, and trees. If drained, some areas are suited to corn, sorghums, and soybeans. A good cropping system consists of 3 or more years of a sod crop followed by 1 year of a row crop. It is best, however, to keep these soils in permanent vegetation.

To improve the tilth and fertility of these soils, add moderately large to large amounts of fertilizer, lime, and organic matter. Prolonged wetness interferes with tillage, and most areas need artificial drainage ditches to remove excess water.

CAPABILITY UNIT VIe-2

This capability unit consists of moderately deep, well-drained, severely eroded soils that are moderately coarse textured to moderately fine textured. These soils are in strongly sloping areas on uplands. Their root zone is moderately thick; bedrock is at a depth greater than 22 vegetation. If these soils are planted to sod crops, provide contour tillage and grassed waterways.

CAPABILITY UNIT VIe-4

This capability unit consists of shallow to very shallow, well-drained to excessively drained soils on uplands. These soils have a thin to very thin root zone; bedrock is at a depth of 8 to 20 inches. The surface soil is friable fine sandy loam, shaly fine sandy loam, shaly silt loam, or silty clay loam, 3 to 6 inches thick. The subsoil is thin to very thin and is fine sandy loam, loam, silty clay loam, shaly silty clay loam, or silty clay.

Infiltration of water through these soils is medium to slow, and the permeability is slow to rapid. The moisture-supplying capacity is low to very low. Surface runoff is medium to rapid, and the hazard of erosion is moderate to severe. These soils are low in organic matter and in fertility and are medium acid to very strongly acid. They are:

Enders and Albertville soils, shallow, 10 to 15 percent slopes.
Enders and Albertville soils, shallow, 10 to 15 percent slopes, eroded.
Enders and Albertville silty clay loams, shallow, 6 to 10 percent slopes, severely eroded.
Hartsells fine sandy loam, shallow, 10 to 15 percent slopes.
Hartsells fine sandy loam, shallow, 10 to 15 percent slopes, eroded.
Muskingum stony fine sandy loam, 10 to 15 percent slopes.
Pottsville shaly silt loam, 10 to 15 percent slopes.

The Muskingum soil in this group is stony. Shallow gullies are common in the severely eroded Enders and Albertville soils.

About three-fourths of the acreage in these soils is in forest and in idle cropland; only one-tenth is cultivated. The remaining acreage is in pasture. Forestry (fig. 14) is

Almost all of the acreage in these land types is wooded or is idle. A small part is cultivated or in pasture. If

TABLE 5.—*Expected average yields per acre of*

[Yields in columns A are to be expected under common management; yields in columns B, under

Soil	Capability unit	Field corn		Cotton (lint)		Oats		Sweet-potatoes		Peppers		Field peas	
		A	B	A	B	A	B	A	B	A	B	A	B
		Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Albertville loam, 2 to 6 percent slopes	IIe–7	40	70	500	800	37	58	250	325	250	400	150	275
Albertville loam, 2 to 6 percent slopes, eroded	IIe–7	38	67	475	750	35	55	235	310	235	380	140	260
Albertville loam, 6 to 10 percent slopes	IIIe–7	39	68	485	775	36	57	245	320	240	390	145	265
Albertville loam, 6 to 10 percent slopes, eroded	IIIe–7	36	65	470	740	34	54	230	305	230	370	135	250
Albertville loam, 10 to 15 percent slopes, eroded	IVe–7	34	55	425	600	32	50	210	265	210	320	125	235
Albertville silty clay loam, 2 to 6 percent slopes, severely eroded.	IIIe–7	32	60	420	675	30	50	205	275	205	330	120	225
Albertville silty clay loam, 6 to 10 percent slopes, severely eroded.	IVe–7	27	50	300	550	23	40	175	235	175	275	100	190
Albertville silty clay loam, 10 to 15 percent slopes, severely eroded.	VIe–2												
Atkins silt loam, local alluvium	IVw–2	35	60			30	45					90	175
Enders silt loam, 2 to 6 percent slopes, eroded	IIe–7	38	67	475	750	35	55	235	310	235	380	140	260
Enders silt loam, 6 to 10 percent slopes, eroded	IIIe–7	32	60	420	675	30	50	205	275	205	330	120	225
Enders and Muse soils, 6 to 15 percent slopes, severely eroded.	IVe–7	27	50	300	550	23	40	175	235	175	275	100	190
Enders and Albertville soils, shallow, 2 to 6 percent slopes, eroded.	IIIe–9	28	50	350	500	30	50	200	260	200	320	120	225
Enders and Albertville soils, shallow, 6 to 10 percent slopes, eroded.	IVe–9	20	35	260	375	22	38	150	195	150	240	90	170
Enders and Albertville soils, shallow, 10 to 15 percent slopes.	VIe–4												
Enders and Albertville soils, shallow, 10 to 15 percent slopes, eroded.	VIe–4												
Enders and Albertville silty clay loams, shallow, 6 to 10 percent slopes, severely eroded.	VIe–4												
Enders and Albertville silty clay loams, shallow, 10 to 15 percent slopes, severely eroded.	VIIe–2												
Gullied land	VIIe–1												

principal crops under two levels of management

improved management. Dashed lines indicate that the soil is not suited to the crop specified]

Lima beans		Pole snap beans		Tomatoes		Irish potatoes		Strawberries		Watermelons		Alfalfa hay		Sericea hay		Pasture	
A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Crates* [1]	*Crates* [1]	*Number*	*Number*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [2]	*Cow-acre-days* [2]
170	270	210	360	220	370	125	225	95	160	700	800	2. 5	3. 5	2. 0	3. 5	90	190
160	255	200	345	210	350	115	200	85	145	650	750	2. 3	3. 2	2. 0	3. 3	80	180
165	265	205	350	215	360	120	210	90	150	675	775	2. 5	3. 5	2. 0	3. 5	90	190
155	250	195	335	200	340	110	190	80	140	625	725	2. 3	3. 2	2. 0	3. 3	80	180
145	215	185	285	190	290	100	160	70	100	590	635	2. 1	2. 8	1. 9	2. 8	70	150
140	225	175	300	180	305	90	170	65	105	575	650	2. 0	3. 0	1. 8	3. 0	65	160
115	185	145	250	150	255	80	145	60	95	475	555	1. 8	2. 5	1. 5	2. 5	60	135
														. 7	1. 2	45	120
125	190	135	250	180	310											100	200
160	255	200	345	210	350	115	200	85	145	650	750	2. 3	3. 2	2. 0	3. 3	80	180
140	225	175	300	180	305	100	170	65	105	575	650	2. 0	3. 0	1. 8	3. 0	70	160
115	185	145	250	150	255	80	145	60	95	475	555	1. 8	2. 5	1. 5	2. 5	60	135
140	225	175	300	190	320	105	180	75	120	600	700	1. 7	2. 5	1. 7	2. 5	60	140
105	170	135	225	145	240	80	135	55	90	450	525	1. 3	1. 9	1. 3	1. 9	45	105
														1. 0	1. 4	40	90
														. 7	1. 1	35	85
														. 6	. 9	30	85
														. 5	. 8	25	80
															1. 0		90
185	290	230	390	225	380	165	275	100	160	800	1, 000	3. 0	4. 0	2. 3	3. 8	100	200
170	275	215	370	215	365	160	270	95	155	775	975	2. 8	3. 9	2. 2	3. 6	95	195
175	275	220	375	220	370	165	275	95	160	800	1, 000	2. 7	3. 8	2. 0	3. 5	90	190
160	250	200	350	200	335	150	250	85	150	725	900	2. 5	3. 5	1. 8	3. 2	75	180
165	265	210	360	210	355	155	265	90	155	760	950	2. 7	3. 8	2. 0	3. 5	90	190
150	240	190	340	190	325	145	240	80	140	700	850	2. 5	3. 5	1. 8	3. 2	75	180
130	225	170	315	175	300	120	200	70	115	600	700	2. 0	2. 7	1. 7	3. 0	60	150
150	240	185	325	190	325	115	190	80	130	650	750	1. 7	2. 5	1. 8	2. 7	50	120
115	180	140	245	145	245	85	145	60	90	490	560	1. 3	1. 9	1. 4	2. 1	40	100
														1. 2	1. 7	35	95
														1. 0	1. 5	30	90
														. 5	. 7	25	80
145	225	185	320	185	300	135	225	80	140	700	800	2. 4	3. 4	1. 8	3. 2	70	165
135	210	175	305	175	285	130	210	75	130	650	750	2. 3	3. 2	1. 7	3. 0	65	155
125	200	160	290	160	275	110	190	65	115	600	700	2. 0	2. 8	1. 5	2. 5	55	140
130	200	150	290	190	320									1. 0	1. 7	125	210
160	255	200	345	210	350	100	180	50	80	400	600	1. 5	2. 5	1. 5	2. 5	90	190
150	230	180	320	200	320	80	150	35	65	350	510	1. 3	2. 2	1. 3	2. 2	80	175
175	275	220	375	220	370	165	275	95	160	800	1, 000	2. 7	3. 8	2. 0	3. 5	90	190
160	250	200	350	200	335	150	250	85	150	725	900	2. 5	3. 5	1. 8	3. 2	75	180
165	265	210	360	210	355	155	265	90	155	760	950	2. 7	3. 8	2. 0	3. 5	90	190

TABLE 5.—*Expected average yields per acre of principal*

Soil	Capability unit	Field corn		Cotton (lint)		Oats		Sweet-potatoes		Peppers		Field peas	
		A	B	A	B	A	B	A	B	A	B	A	B
		Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Linker fine sandy loam, 6 to 10 percent slopes, eroded.	IIIe–2	38	68	450	750	38	58	280	375	230	380	130	240
Linker fine sandy loam, 6 to 10 percent slopes, severely eroded.	IVe–2	30	55	350	500	30	50	200	290	175	300	85	170
Linker fine sandy loam, 10 to 15 percent slopes	IVe–2	36	64	400	700	36	55	270	350	220	360	120	220
Linker fine sandy loam, 10 to 15 percent slopes, eroded.	IVe–2	32	60	375	550	34	53	225	310	190	325	100	200
Linker fine sandy loam, 10 to 15 percent slopes, severely eroded.	VIe–2												
Made land	VIIe–1												
Mine pits and dumps	VIIe–1												
Monongahela fine sandy loam, 0 to 2 percent slopes.	IIw–2	40	70	400	700	30	45	160	240	200	300	140	260
Monongahela fine sandy loam, 2 to 6 percent slopes.	IIe–5	40	70	450	750	35	50	200	270	225	350	140	260
Muse shaly silt loam, 2 to 6 percent slopes, eroded.	IIe–7	38	67	475	750	40	60	235	310	235	380	140	260
Muse shaly silt loam, 6 to 10 percent slopes, eroded.	IIIe–7	36	64	425	700	38	57	220	300	225	360	130	250
Muse shaly silt loam, 10 to 15 percent slopes, eroded.	IVe–7	34	55	425	600	32	50	210	265	210	320	125	235
Muskingum stony fine sandy loam, 10 to 15 percent slopes.	VIe–4												
Muskingum stony fine sandy loam, 15 to 45 percent slopes.	VIIe–2												
Philo loam	IIIw–2	45	80	425	750	45	60	190	275	200	400	180	300
Philo and Stendal soils, local alluvium	IIIw–2	40	75	300	450	40	50			150	300	150	235
Pope fine sandy loam	IIw–1	50	90	500	800	45	70	250	350	200	400	180	300
Pottsville shaly silt loam, 2 to 10 percent slopes, eroded.	IVe–9	20	35	260	375	22	38					90	170
Pottsville shaly silt loam, 10 to 15 percent slopes.	VIe–4												
Pottsville shaly silt loam, 15 to 45 percent	VII–2												

crops under two levels of management—Continued

Lima beans		Pole snap beans		Tomatoes		Irish potatoes		Strawberries		Watermelons		Alfalfa hay		Sericea hay		Pasture	
A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Crates* [1]	*Crates* [1]	*Number*	*Number*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [2]	*Cow-acre-days* [2]
150	240	190	340	190	325	145	240	80	140	700	850	2. 5	3. 5	1. 8	3. 2	75	180
110	190	145	260	150	260	105	180	60	100	550	700	2. 1	3. 0	1. 5	2. 8	65	150
140	220	180	320	180	310	140	230	80	140	700	850	2. 6	3. 7	1. 9	3. 1	80	185
125	200	160	290	160	275	120	200	65	115	600	750	2. 3	3. 2	1. 7	3. 0	75	180
														1. 0	1. 5	60	130
130	200	150	290	190	320	80	150	35	65	350	500	1. 3	2. 2	1. 5	2. 5	100	200
160	255	200	345	210	350	100	180	50	80	400	600	1. 5	2. 5	1. 5	2. 5	90	190
160	255	200	245	210	350	115	200	85	145	650	750	2. 3	3. 2	2. 0	3. 3	80	180
150	240	190	330	200	330	105	190	80	135	620	720	2. 2	3. 1	2. 0	3. 3	75	175
145	215	185	285	190	290	100	160	70	100	590	635	2. 1	2. 8	1. 9	2. 8	70	150
																30	90
200	300	240	400	215	360	95	170	30	50	350	525			1. 3	2. 1	140	225

Use and Management of Woodland [3]

This section consists of three main parts. In the first part, the soils of the county are placed in woodland suitability groups. The growth of trees on these groups of soils and limitations to growth are discussed. The second part suggests practices for the management of stands of pine in three size classes. The third part consists of two tables that list stand and yield data for loblolly, shortleaf, and Virginia pine.

Woodland Suitability Groups

To assist in planning the use of soils for growing trees, the soils in Cullman County have been placed in 13 woodland suitability groups. A woodland suitability group consists of soils that have about the same limitations to growth of trees and that need about the same management

Limitations are *slight* if there are no restrictions on the type of equipment or on the time of year that equipment can be used. They are *moderate* where slopes are moderately steep or where heavy equipment is restricted by wetness in winter and early in spring. In some areas, the firm, clayey subsoil may be excessively wet and may be exposed by erosion. Equipment limitations are *severe* on moderately steep and steep soils that are stony and have rock outcrops. They are also severe on wet bottom lands and low terraces in winter or early in spring.

Erosion hazard is rated according to the risk of erosion on well-managed woodland. The hazard of erosion is *slight* where only a slight loss of soil is expected. Generally, soils have only slight erosion if slopes range from 0 to 2 percent, and runoff is slow or very slow. Erosion hazard is *moderate* where there would be a moderate loss of soil if runoff is not controlled and the vegetative cover

TABLE 6.—*Growth of trees on woodland suitability groups and hazards to growth and management*

[Dashed lines indicate absence of data]

Group number	Soil name and symbol	Site index			Seedling mortality	Plant competition	Equipment limitations	Erosion hazard	Windthrow hazard
		Loblolly pine	Shortleaf pine	Virginia pine					
1	Atkins silt loam, local alluvium (At).	86±4	---	---	Slight	Severe	Severe	Slight	Moderate.
2A	Philo loam (Ph)	81±5	79	---	Slight	Severe	Severe	Slight	Slight.
	Philo and Stendal soils, local alluvium (Pm).	81±5	79	---	Slight	Severe	Severe	Slight	Slight.
	Pope fine sandy loam (Po)	81±5	79	---	Slight	Severe	Severe	Slight	Slight.
2B	Johnsburg loam (Jo)	81±5	79	---	Slight	Severe	Severe	Slight	Moderate.
	Purdy silt loam (Pu)	81±5	79	---	Slight	Severe	Severe	Slight	Moderate.
	Tyler silt loam (Ty)	81±5	79	---	Slight	Severe	Severe	Slight	Moderate.
3A	Albertville loam (AbB, AbB2, AbC, AbC2, AbD2).	79±7	69±3	---	Slight	Moderate	Slight	Moderate to severe.	Moderate.
	Muse shaly silt loam (MsB2, MsC2, MsD2).	79±7	69±3	---	Slight	Moderate	Moderate	Moderate to severe.	Slight.
	Sequatchie silt loam (SeA, SeB).	79±7	69±3	---	Slight	Severe	Moderate	Moderate	Slight.
3B	Leadvale loam (LeB, LeB2)	79±7	69±3	---	Slight	Moderate	Moderate	Moderate	Moderate.
	Monongahela fine sandy loam (MoA, MoB).	79±7	69±3	---	Slight	Severe	Moderate	Moderate	Moderate.
4A	Muskingum stony fine sandy loam (MuD, MuE).	74±7	62±15	72	Moderate	Moderate	Severe	Severe	Moderate.
4B	Tydors and Albertville	58±4	58±11	58±10	Slight	Moderate	Slight	Moderate	Moderate.

moisture and standing water make equipment hard to use. Though the windthrow hazard is moderate, a fragipan in these soils restricts the root zone and keeps the

Mainly because the moisture supply is good, plant competition is severe on the Monongahela soils and is moderate on the Leadvale soils. In winter and spring, these soils are normally saturated and equipment limitations are moderate. To prevent it from miring down, heavy equipment should be used with care. The erosion hazard is moderate because these soils are saturated quickly above the fragipan during rains and surface runoff is increased. The pan restricts the growth of roots and causes a moderate windthrow hazard.

WOODLAND SUITABILITY GROUP 4A

In this group are friable, shallow to very shallow, stony soils that are excessively drained and strongly sloping to steep. These soils have rapid permeability and low moisture-supplying capacity, especially on the south-facing slopes. Sandstone bedrock is at a depth ranging from less than 10 to as much as 18 inches. The soils are:

Muskingum stony fine sandy loam, 10 to 15 percent slopes.
Muskingum stony fine sandy loam, 15 to 45 percent slopes.

Loblolly, shortleaf, and Virginia pine are the commercial trees best suited to these soils. The site index for loblolly pine ranges from 67 to 81, and for shortleaf pine from 47 to 77. It is 72 for Virginia pine.

On these soils, most limitations to the growth of trees and most problems of management are caused by a low moisture-supplying capacity, shallowness, and steep slopes. Because moisture is scarce and fertility is low, seedling indexes of those soils are only 54 to 62 for loblolly pine, 47 to 69 for shortleaf pine, and 48 to 68 for Virginia pine.

Most limitations to the growth of trees and most problems of management on the soils of this group are caused by lack of water and by shallowness. Although these soils vary in their moisture-supplying capacity, their moisture content is generally better than that of the soils in group 4A. Their seedling mortality is slight, and competition from undesirable plants is moderate. There is only slight limitation in the use of equipment. The erosion hazard is moderate because drainage is good and slopes are generally mild. The windthrow hazard is moderate.

WOODLAND SUITABILITY GROUP 5A

The soils in this group are well drained to moderately well drained and shallow to moderately deep. They are on nearly level to strongly sloping uplands and foot slopes. This group includes:

Hartsells fine sandy loam, 2 to 6 percent slopes.
Hartsells fine sandy loam, 2 to 6 percent slopes, eroded.
Hartsells fine sandy loam, 6 to 10 percent slopes.
Hartsells fine sandy loam, 6 to 10 percent slopes, eroded.
Hartsells fine sandy loam, 6 to 10 percent slopes, severely eroded.
Hartsells fine sandy loam, shallow, 2 to 6 percent slopes, eroded.
Hartsells fine sandy loam, shallow, 6 to 10 percent slopes, eroded.
Hartsells fine sandy loam, shallow, 10 to 15 percent slopes.
Hartsells fine sandy loam, shallow, 10 to 15 percent slopes.

firm, clayey subsoil; and their moisture-supplying capacity is moderate to low. These soils are:

Albertville silty clay loam, 2 to 6 percent slopes, severely eroded.
Albertville silty clay loam, 6 to 10 percent slopes, severely eroded.
Albertville silty clay loam, 10 to 15 percent slopes, severely eroded.
Enders and Muse soils, 6 to 15 percent slopes, severely eroded.
Hartsells fine sandy loam, shallow, 10 to 15 percent slopes, severely eroded.

Loblolly, shortleaf, and Virginia pine are the commercial trees best suited to these soils. The site index for loblolly pine ranges from 60 to 76, for shortleaf pine from 53 to 71, and for Virginia pine from 47 to 85.

Most limitations to the growth of trees on these soils and most problems of management are caused by low fertility, generally low moisture-supplying capacity, shallowness, and severe erosion. Because of these features, seedling mortality is moderate and plant competition is slight. Slopes are not steep enough to cause more than slight limitations to the use of equipment. Erosion

Pottsville shaly silty clay loam, 10 to 25 percent slopes, eroded.

The Linker soils have moderate permeability and moderate moisture-supplying capacity. The Enders and Albertville soils have a shallow root zone, slow permeability, and low moisture-supplying capacity. In the Pottsville soil, the moisture-supplying capacity is low to very low.

Loblolly, shortleaf, and Virginia pine are fairly well suited to these soils. Site indexes calculated from field data are not available, but estimated indexes are 54 to 62 for loblolly pine, 47 to 69 for shortleaf pine, and 48 to 68 for Virginia pine.

On these soils, most limitations to the growth of trees and most problems of management are caused by severe erosion and by a moderate to very low capacity to supply moisture. The Linker soils in this group have a moderate moisture-supplying capacity, and their seedling mortality is slight; competition from undesirable plants is moderate. The other soils have less capacity to hold water than the Linker soils, and their seedling mortality is moderate;

Seedlings.—Well-stocked and understocked stands in seedlings should be protected by firebreaks and should not be grazed. The removal of undesirable trees is also required on these stands. Plant seedlings in the understocked areas.

Posts and pulpwood.—Firebreaks should be constructed to protect well-stocked and understocked stands in trees of post and pulpwood size. Grazing on these stands should be regulated and undesirable trees removed. The well-stocked stands require general intermediate cutting, and understocked stands require intermediate cutting in their denser parts.

Sawtimber.—Construct firebreaks and regulate grazing [illegible]

TABLE 7.—*Stand and yield data for well-stocked, unmanaged, naturally occurring, normal stands of loblolly and Shortleaf pine*—Continued

Site index	Age	Total volume per acre			Average height of dominant trees	Average diameter at breast height	Trees
	Years	*Cu. ft.*	*Cords*	*Bd. ft. (Doyle)*	*Feet*	*Inches*	*Number per acre*
90	20	2, 850	27		54	5. 6	790
	30	4, 700	46	4, 000	71	8. 2	420
	40	6, 200	61	10, 000	82	10. 2	290

TABLE 8.—*Stand and yield data for Virginia pine in well-stocked, naturally occurring stands*

[Data interpreted from "Virginia Pine," Technical Bulletin No. 100, N.C. Agricultural Experiment Station (7) and from Research Notes 135 of the S.E. Forest Experiment Station (4)]

Site index	Age	Average height of dominant trees	Trees per acre (1 inch DBH [1] and larger)	Average DBH [1]	Basal area per acre	Potential yields per acre			Average annual growth per acre		
	Years	*Feet*	*Number*	*Inches*	*Sq. ft.*	*Cu. ft.*	*Cords* [2]	*Bd. ft.*[3] *(Int. ¼ in. rule)*	*Cu. ft.*	*Cords* [2]	*Bd. ft.*[3] *(Int. ¼ in. rule)*
40	20	19	2, 500	2. 1	60	390	4		19	0. 2	
	30	29	1, 660	3. 4	104	1, 250	14	5, 900	42	. 5	197
	40	36	1, 300	4. 2	125	1, 630	18	7, 700	41	. 4	192
	50	40	1, 110	4. 7	133	1, 820	20	8, 600	37	. 4	172
	60	42	1, 010	5. 0	138	1, 980	22	9, 400	33	. 4	156
	70	43	910	5. 3	139	2, 100	23	9, 900	30	. 3	141
50	20	25	2, 000	2. 8	86	960	11		48	. 5	
	30	37	1, 320	4. 2	127	2, 000	22	9, 500	67	. 6	317
	40	45	970	5. 2	142	2, 700	30	12, 800	67	. 7	320
	50	50	790	5. 9	151	3, 100	34	14, 700	62	. 7	294
	60	52	750	6. 1	153	3, 400	38	16, 100	57	. 6	268
	70	54	700	6. 4	156	3, 600	40	17, 100	51	. 6	244
60	20	31	710	3. 4	108	1, 600	18	7, 600	80	0	380

terms have a meaning to the soil scientist and other agricultural workers that differs from the meaning understood by the engineer. These terms are defined in the Glossary in their agricultural sense. Some of the most common of these terms are also defined as follows:

Soil.—The natural medium for the growth of land plants on the surface of the earth; is composed of organic and mineral materials.

Gravel.—A size group of coarse mineral particles varying in diameter from 2 millimeters to 3 inches. Fine gravel ranges from 2 millimeters to 0.5 inch in diameter.

Sand.—A size group of mineral particles ranging in diameter from 2.0 millimeters to 0.05 millimeter. As a textural class, sand consists of soil material that contains 85 percent or more sand and not more than 10 percent clay.

[redacted]

sieves was determined by mechanical analysis. Permeability, or the rate that a soil transmits water, was estimated for the soils when they were not compacted.

The available water is approximately the amount of water in a soil when it is wet to field capacity, or when the percolation of water downward has practically stopped. It is the amount of water in inches needed to wet 1 foot of air-dried soil. Hence, if a layer of soil 6 inches thick has a capacity for available water of 3 inches, this layer needs 1.5 inches of water to wet it.

Reaction is listed in pH values. Soil material with a pH value of less than 7.0 is acid, and that with a value of more than 7.0 is alkaline.

Dispersion refers to the degree and rapidity that a soil

[redacted]

increases from a very dry state, the material changes from a solid to a semisolid or plastic state. As the moisture content is further increased, the material changes from the plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a solid to a plastic state. The liquid limit is the moisture content at which the material changes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Soil Engineering Data

Some of the information important in engineering can be obtained from the soil map that accompanies this report and from tables 9, 10, and 11. This information

Because the lower parts of bottom lands are flooded in places each year, a continuous embankment may be needed to keep the roadways from being flooded. Suitable material for building these embankments may be obtained from nearby stream terraces and from the colluvial soils.

The soils in Cullman County are rated in table 10 as sources of topsoil suitable for growing vegetation on the slopes of embankments and cuts of highways and in ditches. In addition to being fertile, the topsoil should be free of stones or large pieces of gravel.

The weathered sandstone in which the Hartsells and many of the Tilsit, Hanceville, and Linker soils formed may be used in foundation courses for pavements. The unweathered sandstone and the very small limited acreage of limestone may be quarried for use in the base course of

the soil, the rate of erosion, and the kind of vegetation that grows on the soil. The nature of the parent material also affects the kind of soil profile that is formed. Time is needed for changing the parent material into soil. Normally, a long interval is required for the development of distinct soil horizons.

The factors of soil genesis are so closely related in their effects on the soil that few generalizations can be made regarding the effects of any one factor acting alone. The interrelationship of the factors is so complex that many of the processes that take place in the development of the soils are not known.

PARENT MATERIAL AND PARENT ROCK.—Parent material is the unconsolidated mass from which a soil develops. It is largely responsible for the chemical and mineralogical composition of soils. The parent material of the soils in Cullman County is in two broad classes (1) material residual from the weathering of rocks in place and (2) material transported by water or gravity and laid down as unconsolidated deposits of clay, silt, and sand. Material in the first class is related directly to the underlying rock from which it formed. Material in the second class is related to the soils from which it washed or rolled, but not necessarily to the underlying bedrock where it is deposited.

The parent material that weathered in place consists of residuum from consolidated sedimentary rocks. In Cullman County, these rocks are sandstone and shale in most places and limestone in a very small area. Geologically, the rocks are very old. They were laid down originally as unconsolidated sediments and were gradually converted into consolidated rock.

through the soil profile. In a large area, the amount of water that actually percolates through the soil depends mainly on rainfall, relative humidity, and the length of the frost-free period. At a given point, the amount of downward percolation is also affected by physiographic position and by soil permeability. Temperature influences the kinds and growth of organisms and the speed of physical and chemical reactions in soils.

Cullman County has a humid-temperate climate. Summers are rather long and hot. Winters are cold but are not severe. Rainfall is fairly high throughout the county. The moderately high temperatures are conducive to rapid chemical reaction in the soil, which is moist much of the year. Because of the high rainfall, most of the soluble materials are leached from the soil. Under the influence of percolating water, soil colloids are also translocated downward in the soil.

The soil is frozen for short periods to shallow depths, but freezing and thawing in this county have little effect on weathering and soil formation. The average annual rainfall is 55.76 inches, and the average annual temperature is 60.9° F. Snow is fairly common, but it is normally light and remains on the ground for only brief periods. The average frost-free period of 201 days extends from April 8 to October 26.

PLANT AND ANIMAL LIFE.—Trees, grasses, micro-organisms, earthworms, and various other forms of plants and animals live on and in the soil and are active in its formation. The kinds of plants and animals that live on and in the soil are determined by environmental factors, which include climate, parent material, relief, age of the soil, and other organisms.

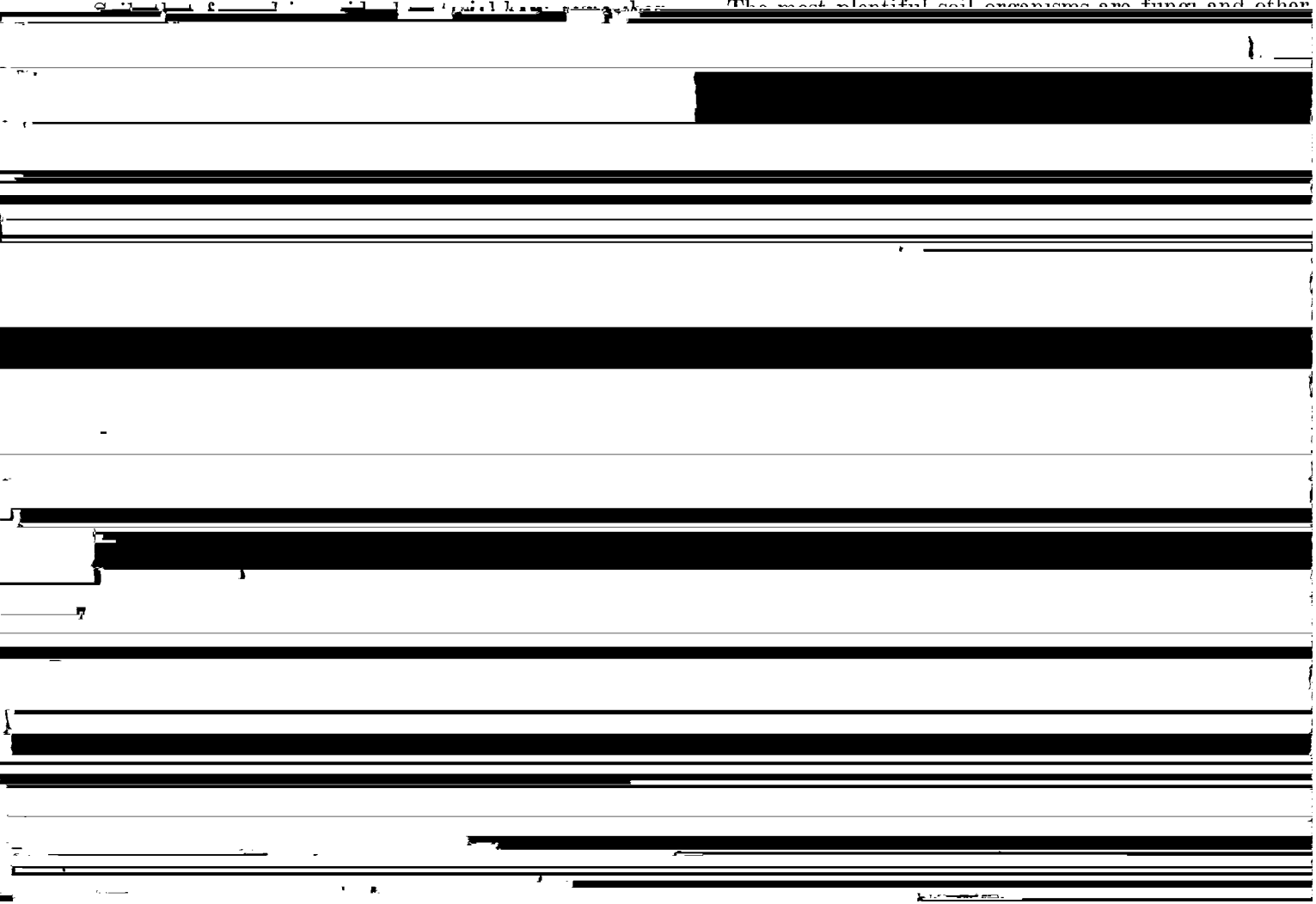


TABLE 9.—*Brief description of soils*

Soil [1]	Depth to seasonally high water table [2]	Depth to bedrock	Soil description	Depth from surface (typical profile)	Classification	
					USDA	Unified
	Feet	*Feet*		*Inches*		
Albertville	20+	1. 5 to 4+	1.5 to 4 feet of well-drained loam to silty clay loam or silty clay underlain by thinly bedded shale and some sandstone.	0 to 7	Loam	ML, SM, or ML-CL.
				7 to 17	Silty clay loam	CL or MH
				17 to 41	Silty clay	MH or ML
Albertville, shallow	20+	1 to 1. 7	12 to 20 inches of well-drained fine sandy loam, loam, and silty clay loam to silty clay over thinly bedded shale and some sandstone.	0 to 10	Fine sandy loam or loam.	ML or CL
				10 to 20	Silty clay loam	CL or MH
Atkins	(3)	3 to 6+	3 to 6 feet of poorly drained silt loam over stratified local alluvium of loam, silt, and sand overlying shale and sandstone.	0 to 21	Silt loam	ML or CL
				21 to 75	Fine sandy loam or fine sandy clay loam.	ML or CL
Enders	20+	1. 5 to 4+	1.5 to 4 feet of well-drained silt loam and silty clay over shale.	0 to 8. 5	Silt loam	ML or ML-CL.
				8. 5 to 33	Silty clay	MH or CL
Enders, shallow	20+	1. 0 to 1. 7	12 to 20 inches of well-drained shaly fine sandy loam and silty clay over shale.	0 to 5	Fine sandy loam	SM, ML, or CL.
				5 to 12	Silty clay	CL or MH
Hanceville	20+	3. 0 to 8+	3 to 8 feet of well-drained loam and clay loam underlain by sandstone with thin beds of shale.	0 to 12	Loam	CL or ML
				12 to 80	Clay loam	CL or ML
				80 to 90	Sandy clay loam or sandy clay.	CL or ML
Hartsells	20+	1. 5 to 5. 0+	1.5 to 5 feet of well-drained fine sandy loam, loam, or fine sandy clay loam over sandstone with thin lenses of shale.	0 to 10	Fine sandy loam	CL or SM
				10 to 26	Loam	ML or CL
				26 to 48+	Fine sandy clay loam.	SC-CL, SM or ML.
Hartsells, shallow	20+	1 to 1. 5	12 to 18 inches of well-drained fine sandy loam, loam, and silty clay loam over sandstone with thin lenses of shale.	0 to 6	Fine sandy loam	SM or CL
				6 to 14	Loam	ML or CL
				14 to 18	Silty clay loam	ML or CL
Jefferson	20+	4 to 10	4 to 10 feet of well-drained fine sandy loam, loam, and fine sandy clay loam; in local alluvium washed from soils underlain by sandstone and shale.	0 to 12	Fine sandy loam	SM or CL
				12 to 33	Fine sandy clay loam.	ML or CL
Johnsburg	[4] 0 to 2	3 to 5	3 to 5 feet of somewhat poorly drained loam to silty clay loam over shale and sandstone; fragipan at a depth of 20 to 30 inches.	0 to 16	Loam	ML or CL
				16 to 22	Clay loam	ML or CL
				22 to 33	Clay loam	ML or CL
				33 to 57	Silty clay loam	ML or CL
Leadvale	2 to 4	3 to 6	3 to 6 feet of moderately well drained loam and silt loam; old local alluvium over shale and sandstone; fragipan at a	0 to 5	Loam	ML or SM
				5 to 22	Silt loam	ML or CL
				22 to 30+	Silt loam	ML or CL

and their estimated physical properties

Classification	Percentage passing sieve—			Permeability	Soil structure	Available water	Reaction	Dispersion	Shrink-swell potential
AASHO	No. 200 (0.074 mm.)	No. 10 (2.0 mm.)	No. 4 (4.76 mm.)						
				Inches per hr.		*Inches per ft of depth*			
A–4	45–80	85–95	90–100	0. 8 to 2. 0	Granular	1. 2 to 1. 8	5. 1 to 5. 5	High	Low.
A–4 or A–7	55–95	90–100	90–100	. 8 to 2. 0	Subangular blocky	1. 0 to 1. 6	4. 5 to 5. 0	Moderate	Moderate.
A–6 or A–7	60–95	95–100	95–100	. 2 to 0. 8	Subangular blocky	. 8 to 1. 4	4. 5 to 5. 0	Moderate	Moderate.
A–4	50–70	80–90	85–95	. 8 to 2. 0	Granular to subangular blocky.	1. 2 to 1. 8	4. 5 to 5. 0	High	Low.
A–4, A–6, or A–7.	60–90	90–100	90–100	. 2 to 2. 0	Subangular blocky	. 6 to 1. 2	4. 5 to 5. 0	Moderate	Moderate.
A–4	85–100	95–100	100	. 2 to 0. 8	Granular	1. 8 to 2. 4	4. 5 to 5. 5	High	Low.
A–4, A–6, or A–7.	55–85	90–100	100	. 2 to 0. 8	Massive	1. 8 to 2. 4	4. 5 to 5. 0	Moderate	Moderate.
A–4	55–80	85–95	90–100	. 8 to 2. 0	Granular to subangular blocky.	1. 2 to 1. 8	5. 1 to 6. 0	High	Low.
A–4 or A–7	55–85	90–100	90–100	. 2 to 0. 8	Subangular blocky	. 8 to 1. 4	5. 1 to 5. 5	Moderate	Moderate.
A–4 or A–6	45–70	80–90	85–95	. 8 to 2. 0	Granular	1. 2 to 1. 8	4. 5 to 5. 0	High	Low.
A–4, A–6, or A–7.	60–90	90–100	90–100	. 2 to 2. 0	Subangular blocky	. 6 to 1. 2	4. 5 to 5. 0	Moderate	Moderate.
A–4	75–90	90–100	95–100	. 8 to 2. 0	Granular and subangular blocky.	1. 8 to 2. 4	5. 1 to 6. 0	High	Low.
A–4 or A–6	80–95	90–100	95–100	. 8 to 2. 0	Subangular blocky and angular blocky.	1. 8 to 2. 4	4. 5 to 5. 0	Moderate	Low to moderate.
A–6	55–65	90–100	90–100	. 8 to 2. 0	Massive	1. 8 to 2. 4	4. 5 to 5. 0	Moderate	Low to moderate.
A–4	40–70	90–100	97–100	2. 0 to 5. 0	Granular and subangular blocky.	1. 8 to 2. 4	5. 1 to 5. 5	High	Low.
A–4 or A–6	55–75	95–100	95–100	. 8 to 2. 0	Subangular blocky	1. 8 to 2. 4	5. 1 to 5. 5	High	Low.
A–4 or A–6	40–70	90–100	90–100	. 8 to 2. 0	Subangular blocky and angular blocky.	1. 5 to 2. 1	5. 1 to 5. 5	High to moderate.	Low.
A–4	40–70	90–100	97–100	2. 0 to 6. 0	Granular and subangular blocky.	1. 8 to 2. 4	5. 1 to 5. 5	High	Low.
A–4 or A–6	55–75	95–100	95–100	. 8 to 2. 0	Subangular blocky	1. 8 to 2. 4	5. 1 to 5. 5	High	Low.
A–6 or A–4	50–70	90–100	90–100	. 8 to 2. 0	Subangular blocky and angular blocky.	1. 5 to 2. 1	5. 1 to 5. 5	High to moderate.	Low to moderate.
A–4	45–65	90–100	95–100	2. 0 to 5. 0	Granular and subangular blocky.	1. 8 to 2. 4	4. 5 to 5. 5	High	Low.
A–4 or A–6	50–70	95–100	95–100	. 8 to 2. 0	Subangular blocky	1. 8 to 2. 4	4. 5 to 5. 0	High to moderate.	Low to moderate.
A–4	75–85	90–100	95–100	. 8 to 2. 0	Granular and subangular blocky.	1. 2 to 1. 8	4. 5 to 5. 5	High	Low.
A–4 or A–6	75–95	90–100	95–100	. 8 to 2. 0	Subangular blocky	1. 2 to 1. 8	5. 1 to 5. 5	Moderate	Moderate.
A–4 or A–6	75–95	90–100	90–100	. 2 to 0. 8	Subangular blocky	. 6 to 1. 2	5. 1 to 5. 5	Low	Low.
A–4 or A–6	75–95	75–100	80–100	. 2 to 0. 8	Angular blocky and subangular blocky.	. 6 to 1. 2	5. 6 to 6. 0	Low to moderate.	Moderate.
A–2 or A–4	30–60	80–95	80–100	. 8 to 2. 0	Granular	1. 2 to 1. 8	5. 6 to 6. 0	High	Low.
A–6 or A–4	60–80	90–100	95–100	. 8 to 2. 0	Subangular blocky	1. 2 to 1. 8	4. 5 to 5. 0	High	Low.
A–4 or A–6	55–75	60–95	70–100	. 2 to 0. 8	Subangular blocky	. 6 to 1. 2	4. 5 to 5. 0	Low	Low.

TABLE 9.—*Brief description of soils*

Soil [1]	Depth to seasonally high water table [2]	Depth to bedrock	Soil description	Depth from surface (typical profile)	Classification	
					USDA	Unified
	Feet	*Feet*		*Inches*		
Linker	20+	3 to 8	3 to 8 feet of well-drained fine sandy loam, loam, and clay loam on sandstone and some shale.	0 to 14	Loam	ML or CL
				14 to 60+	Clay loam	ML, CL, or MH.
Monongahela	1. 5 to 4	4 to 8	4 to 8 feet of moderately well drained fine sandy loam to clay loam; compact, cemented layer at a depth of 16 to 24 inches; in old local alluvium from soils underlain by sandstone and shale.	0 to 7	Fine sandy loam	ML
				7 to 18	Clay loam	ML or CL
				18 to 26+	Clay loam	ML or CL
Muse	20+	4 to 10	4 to 10 feet of well-drained shaly silt loam, loam, and silty clay loam; old local alluvium on foot slopes derived from shale.	0 to 5	Shaly silt loam	ML or CL
				5 to 25	Loam	ML or CL
				25 to 60+	Silty clay loam	ML or CL
Muskingum	20+	. 8 to 1. 5	10 to 18 inches of excessively drained stony fine sandy loam and loamy fine sand over sandstone with thin lenses of shale.	0 to 12	Stony fine sandy loam.	SM or SC
Philo	1 to 2	2 to 6	2 to 6 feet of moderately well drained loam and fine sandy loam; on flood plains in general alluvium washed from soils derived from sandstone and shale.	0 to 18	Loam	ML or CL
				18 to 36+	Silt loam	ML or CL
Philo and Stendal	0 to 2	2 to 5	2 to 5 feet of moderately well drained to somewhat poorly drained fine sandy loam to silt loam; in local alluvium that washed from soils derived from sandstone and shale; subject to flooding.	0 to 15	Fine sandy loam or silt loam.	ML or CL
				15+	Fine sandy loam or silt loam.	ML or CL
Pope	2 to 3	3 to 6	3 to 6 feet of well-drained fine sandy loam and silt loam over stratified gravel, silt, and sand; subject to periodic overflow.	0 to 19	Fine sandy loam	SM, SC, or ML.
				19 to 36+	Silt loam	ML or CL
Pottsville	20+	. 75 to 1. 5	9 to 18 inches of excessively drained shaly silt loam and shaly silty clay; primarily on shale.	0 to 5	Shaly silt loam	ML–CL or SM–SC.
				5 to 9	Shaly silty clay	ML, MH, or GM.
Purdy	0 to 1	5 to 7	5 to 7 feet of poorly drained silt loam to silty clay and clay; on low stream terraces in alluvium washed from soils derived from sandstone and shale; water stands for long periods.	0 to 15	Silt loam	ML or CL
				15 to 36	Silty clay loam	CL or ML
				36 to 72	Silty clay or clay	CL or ML
Rockland, limestone.	20+	0 to 2	0 to 2 feet of moderately well drained silty clay or clay with ledges and boulders of limestone.	0 to 24	Silty clay or clay	CH or MH
Rockland, sandstone.	20+	0 to 3	0 to 3 feet of well-drained fine sandy loam and loamy fine sand with ledges, boulders, and stones (sandstone).	0 to 36	Loamy fine sand or fine sandy loam.	SM or ML
Sandy alluvial land	0 to 15	1 to 15	1 to 15 feet of excessively drained loamy fine sand; stony and gravelly in places.	1 to 180	Loamy fine sand	GM or SM

See footnotes at end of table.

and their estimated physical properties—Continued

Classification		Percentage passing sieve—		Permeability	Soil structure	Available water	Reaction	Dispersion	Shrink-swell potential
AASHO	No. 200 (0.074 mm.)	No. 10 (2.0 mm.)	No. 4 (4.76 mm.)						
				Inches per hr.		*Inches per ft of depth*			
A–4	50–70	90–100	90–100	2.0 to 4.0	Granular and subangular blocky.	1.2 to 1.8	5.1 to 6.0	High	Low.
A–4 or A–6	65–80	90–95	95–100	.8 to 2.0	Subangular blocky and angular blocky.	1.5 to 2.1	5.1 to 6.0	Moderate	Moderate.
A–4	55–75	95–100	95–100	.8 to 2.0	Granular	1.2 to 1.8	5.1 to 5.5	High	Low.
A–4 or A–6	60–80	90–100	95–100	.8 to 2.0	Subangular blocky	1.2 to 1.8	4.5 to 5.0	Moderate	Low to moderate.
A–4 or A–6	60–80	90–100	90–100	.2 to 0.8	Subangular blocky	.6 to 1.2	4.5 to 5.0	Moderate	Low.
A–4	70–80	85–100	95–100	.8 to 2.0	Granular	1.2 to 1.8	5.6 to 6.0	High	Low.
A–4, A–6, or A–7.	80–95	90–100	95–100	.8 to 2.0	Granular and subangular blocky.	1.2 to 1.8	5.1 to 5.5	High to moderate.	Low.
A–6 or A–7	75–95	85–100	95–100	.8 to 2.0	Subangular blocky and massive.	1.2 to 1.8	4.5 to 5.0	Moderate	Moderate
A–4 or A–2	30–50	80–95	80–95	2.0 to 10.0	Granular and subangular blocky.	.6 to 1.2	5.1 to 5.5	High	Low.
A–4 or A–6	70–90	90–100	95–100	.8 to 2.0	Granular and subangular blocky.	1.8 to 2.4	5.1 to 6.0	High	Low.
A–4 or A–6	60–85	85–100	95–100	.8 to 2.0	Massive	1.8 to 2.4	5.1 to 5.5	High	Low.
A–4 to A–6	50–80	85–100	95–100	.8 to 2.0	Granular and subangular blocky.	1.5 to 2.1	5.1 to 6.0	High	Low.
A–4 or A–6	50–80	75–100	95–100	.2 to 2.0	Granular and subangular blocky.	1.5 to 2.1	5.1 to 5.5	High	Low.
A–4	45–75	90–100	95–100	.8 to 5.0	Granular	1.8 to 2.4	5.1 to 6.5	High	Low.
A–4 or A–6	55–75	95–100	95–100	.8 to 5.0	Granular	1.8 to 2.4	5.1 to 5.5	High	Low.
A–4	40–75	75–85	75–90	.8 to 2.0	Granular	.6 to 1.2	5.6 to 6.0	High	Low.
A–4 or A–7	40–90	60–95	60–95	.2 to 4.0	Platy and massive in places.	.6 to 1.2	4.5 to 5.0	High to moderate.	Low to moderate.
A–4	80–90	95–100	95–100	.2 to 0.8	Granular	.6 to 1.2	4.5 to 5.5	High	Low.
A–4 or A–6	80–90	95–100	95–100	.2 to 0.8	Subangular blocky	.6 to 1.2	4.5 to 5.0	Moderate	Moderate.
A–6 or A–7	80–90	95–100	95–100	.2 to 0.8	Massive	.6 to 1.2	5.1 to 5.5	Low	Moderate to high.
A–6 or A–7	75–85	90–100	90–100	.2 to 0.8	Massive	.0 to 1.2	5.1 to 7.0	Low	Moderate to high.
A–2, A–4	30–55	95–100	95–100	2.0 to 10.0	Granular	.5 to 1.0	4.5 to 5.0	High	Low

TABLE 9.—*Brief description of soils*

Soil [1]	Depth to seasonally high water table [2]	Depth to bedrock	Soil description	Depth from surface (typical profile)	Classification	
					USDA	Unified
	Feet	*Feet*		*Inches*		
Sequatchie	4	5 to 8	2 to 4.5 feet of well-drained silt loam and silty clay loam over stratified, thin beds of sand, silt, and gravel; in old general alluvium washed from soils underlain by shale and sandstone.	0 to 10	Silt loam	ML or CL
				10 to 31	Silty clay loam	CL or ML
				31 to 60	Sandy loam	SM, SC, or ML.
				60 to 66+	Loamy fine sand	SM or SP
Tilsit	[4] 1. 5 to 2	4 to 7	1.5 to 2.0 feet of moderately well drained fine sandy loam and loam over compact fragipan; 6 to 18 inches thick over fine sandy clay loam or fine sandy clay on sandstone with some shale.	0 to 6	Fine sandy loam.	SM or ML
				6 to 22	Loam	CL or ML
				22 to 34	Fine sandy loam	ML or CL
				34 to 61	Fine sandy clay loam.	CL
Tyler	. 5 to 2	4 to 8	1 to 3 feet of somewhat poorly drained silt loam and silty clay loam over a compact layer of silty clay loam to silty clay over raw shaly clay; on low stream terraces in old alluvium washed from soils derived from shale and sandstone.	0 to 24	Silt loam	ML or CL
				24 to 34	Silty clay loam	CL, ML or MH.
				34 to 60	Silty clay	CL or ML
				60 to 85	Shaly clay	CL or MH

[1] Gullied land, Made land, and Mine pits and dumps are not included in table.
[2] Normally the water table rises to a point near the surface during winter.

weakly developed. Thus, the Muskingum, Pottsville, and other soils on steep slopes have a thin or very thin surface layer that overlies partly weathered parent material or parent rock.

TIME.—The length of time required for soils to develop depends largely on the other four factors of soil formation. Generally, it takes less time for a soil to develop in humid, warm regions with luxuriant vegetation than it does for one to develop in dry or cold regions with scanty vegetation or moisture.

The soils in Cullman County range from very young to very old. The young soils in the county are in two broad groups. In one group, the soil material has been in place for only a short time and has not been affected enough by climate and vegetation for a profile with well-defined, genetically related horizons to form. Most soils on first bottoms are of this kind. In the other group, the soil material forms on steep slopes. Here, genetically related horizons do not form because the soil material is removed by erosion almost as fast as it forms.

Soils are mature or old if they have been in place for a long time and are about in equilibrium with their environment. In some places, nearly level, well-drained soils that are only slightly eroded have more strongly marked profile characteristics than have some well-drained, well-developed soils on sloping uplands.

Classification of Soils

From the broadest category to the narrowest, soils are type, and phase. Series, type, and phase are defined in the section "How a Soil Survey is Made." The category of the soil order consists of three classes—zonal, intrazonal, and azonal soils. Each of these orders consists of a number of great soil groups. In a great soil group are soils that have fundamental characteristics in common.

The zonal soil order consists of those great soil groups that have soils with well-developed profile characteristics that reflect the influence of the active factors of soil genesis. The active factors are climate and living organisms, chiefly vegetation. In Cullman County, the great soil groups in the zonal order are the Red-Yellow Podzolic soils, the Reddish-Brown Lateritic soils, and the Gray-Brown Podzolic soils.

The intrazonal order consists of those great soil groups with distinct, genetically related horizons that reflect the dominating influence of some local factor of topography or parent material over the effects of climate and living organisms. In Cullman County, the profile characteristics of intrazonal soils are influenced generally by their nearly level relief, which is greatly modified by the effects of parent material and vegetation. The intrazonal soils in this county are members of the Planosol and Low-Humic Gley great soil groups.

The azonal order consists of soils that lack well-developed profile characteristics. Resistant parent material, steep topography, or insufficient time since deposition have prevented the development of normal profile characteristics. In Cullman County, azonal soils have a moderately dark to very dark A, horizon that is fairly high

and their estimated physical properties—Continued

Classification	Percentage passing sieve—			Permeability	Soil structure	Available water	Reaction	Dispersion	Shrink-swell potential
AASHO	No. 200 (0.074 mm.)	No. 10 (2.0 mm.)	No. 4 (4.76 mm.)						
				Inches per hr.		*Inches per ft of depth*			

TABLE 10.—*Engineering*

Soil [1]	Suitability of soil for grading in winter and wet weather	Suitability of soil material for—			Suitability as source of—		Features affecting vertical alinement for highways
		Septic tanks	Road subgrade [2]	Road fill	Topsoil [3]	Sand	
Albertville	Fair to poor	Fair to poor	Fair to poor	Good to fair	Good	Unsuitable	Bedrock; good drainage.
Albertville, shallow.	Fair to poor	Fair to poor	Fair to poor	Good to fair	Good	Unsuitable	Bedrock; good drainage.
Atkins	Unsuitable	Unsuitable	Fair to poor	Fair	Fair to poor	Unsuitable	High water table most of year; highway 2 to 4 feet above water table.
Enders	Fair to poor	Fair to poor	Fair to poor	Good to fair	Good	Unsuitable	Bedrock; good drainage.
Enders, shallow	Fair to poor	Fair to poor	Fair to poor	Good to fair	Good	Unsuitable	Bedrock; good drainage.
Hanceville	Fair to poor	Good	Good to fair	Good	Good	Unsuitable	Bedrock; good drainage.
Hartsells	Good to fair	Good	Good	Good	Good	Fair to unsuitable.[5]	Bedrock; good drainage.
Hartsells, shallow	Good to fair	Good to fair	Good	Good	Good	Fair to unsuitable.[5]	Bedrock; good drainage.
Jefferson	Good to fair	Good	Good	Good	Good	Unsuitable	Bedrock; good drainage.
Johnsburg	Poor	Poor	Fair to poor	Fair	Fair	Unsuitable	Seasonal high water table; highway 2 feet above surface.
Leadvale	Poor	Poor	Good to fair	Good	Fair	Unsuitable	Bedrock; seasonal high

interpretation of soils

Soil features affecting agricultural structures					
Farm ponds		Drainage structures	Irrigation structures	Terraces and diversions [4]	Waterways
Reservoir areas	Embankments				
Fairly impervious	Moderate strength	Not needed	Medium infiltration;	Needed; easy to	Erodible; needs

TABLE 10.—*Engineering*

Soil [1]	Suitability of soil for grading in winter and wet weather	Suitability of soil material for—			Suitability as source of—		Features affecting vertical alinement for highways
		Septic tanks	Road subgrade [2]	Road fill	Topsoil [3]	Sand	
Muskingum	Good to fair	Poor	Good	Good	Unsuitable	Unsuitable	Bedrock; good drainage.
Philo	Unsuitable	Poor	Good to fair	Good	Good [6]	Unsuitable	Seasonal high water table; highway 2 to 4 feet above water table.
Philo and Stendal	Unsuitable	Poor	Good to fair	Good	Good to fair	Unsuitable	Seasonal high water table; highway 2 to 4 feet above water table.
Pope	Fair to poor	Fair to good	Good	Good	Good [6]	Unsuitable	Seasonal high water table; highway 2 to 4 feet above water table.
Pottsville	Fair	Poor	Fair to poor	Good	Poor	Unsuitable	Bedrock; excessive drainage.
Purdy	Unsuitable	Unsuitable	Poor to fair	Fair	Poor	Unsuitable	Seasonal high water table; highway 2 to 4 feet above surface.
Rockland, limestone.	Good to fair	Unsuitable	Unsuitable	Poor	Unsuitable	Unsuitable	Bedrock; good drainage.
Rockland, sandstone.	Good to fair	Unsuitable	Unsuitable	Poor	Unsuitable	Unsuitable	Bedrock; good drainage.
Sandy alluvial land.	Fair	Fair to good	Good to fair	Fair to poor	Poor	Good	Excessive drainage; highway 2 to 4 feet above ground surface.
Sequatchie	Fair	Fair to poor	Fair to poor	Good	Good	Unsuitable	Good drainage; highway 2 to 4 feet above surface.
Tilsit	Poor	Fair to poor	Good to fair	Good	Good	Unsuitable	Bedrock; perched water table.
Tyler	Unsuitable (high water table).	Unsuitable	Fair to poor	Good	Fair	Unsuitable	Seasonal high water table 2 to 4 feet above surface.

[1] Gullied land, Made land, and Mine pits and dumps are not included in table.
[2] Rating is for disturbed material; proper surface drainage will have to be provided in places.
[3] Rating is for material in A horizon for use on slopes of embankments and in ditches to help growth of vegetation.

interpretation of soils—Continued

Soil features affecting agricultural structures					
Farm ponds		Drainage structures	Irrigation structures	Terraces and diversions [4]	Waterways
Reservoir areas	Embankments				
Excess seepage	Moderate strength and stability.	Not needed	Medium infiltration; low water-holding capacity.	Not recommended	Not recommended.
Fairly impervious material.	Low to moderate strength and stability.	Moderate permeability, periodic flooding.	Medium infiltration; high water-holding capacity.	Not needed	Not needed.
Fairly impervious material.	Low to moderate strength and stability.	Moderate to slow permeability; some flooding or ponding.	Medium infiltration; moderate to high water-holding capacity.	Not needed	Not needed.
Fairly impervious material.	Low to moderate strength and	Moderate to rapid	Medium to rapid infil-	Not needed	Not needed.

TABLE 11.—*Engineering test data* [1] *for*

Soil name and location	Parent material or parent rock	Bureau of Public Roads report no.	Depth	Horizon	Mechanical analysis [2]				
					Percentage passing sieve [3]				
					2 in.	1½-in.	1 in.	¾-in.	⅜-in.
Albertville loam:			*Inches*						
NE¼SW¼ sec. 2, T. 9 S., R. 1 W. (Modal.)	Interbedded shale and sandstone.	S34697	0–5	A_p	------	------	------	------	100
		S34698	5–16	B_2	------	------	------	100	99
		S34699	28–80	C_{12}	------	------	------	------	------
NE¼SE¼ sec. 22, T. 10 S., R. 3 W. (B_1 horizon.)	Interbedded shale and sandstone.	S34700	0–7	A_p	------	------	------	100	99
		S34701	11–17	B_1	------	------	------	------	100
		S34702	17–29	B_2	------	------	------	------	------
		S34703	29–41	B_3	------	------	------	------	------
NW¼NE¼ sec. 16, T. 10 S., R. 1 W. (Grading to Hartsells.)	Interbedded shale and sandstone.	S34704	0–7	A_p	------	------	------	100	98
		S34705	7–17	A_3	------	------	------	100	99
		S34706	17–28	B_2	------	------	------	------	100
		S34707	35–66	C_1	------	------	------	100	99
Atkins silt loam, local alluvium:									
NE¼NE¼ sec. 27, T. 10 S., R. 3 W. (Modal.)	Alluvium	S34708	0–9	A_{11}	------	------	------	------	------
		S34709	19–30	C_{11g}	------	------	------	------	------
		S34710	30–45	C_{12g}	------	------	------	------	------
		S34711	45–68	C_{13g}	------	------	------	------	------
NE¼SW¼ sec. 26, T. 10 S., R. 1 W.	Alluvium	S34712	0–14	A_{1p}	------	------	------	------	------
		S34713	15½–21	A_{2gb}	------	------	------	------	------
		S34714	21–29	C_{11g}	------	------	------	------	------
		S34715	29–75	C_{12g}	------	------	------	------	------
SW¼SE¼ sec. 17, T. 10 S., R. 1 W.	Alluvium	S34716	0–6	A_{pg}	------	------	------	------	------
		S34717	6–13	A_{3g}	------	------	------	------	------
		S34718	13–30	B_{2g}	------	------	------	------	------
		S34719	30–76	C_g	------	------	------	------	------
Enders and Albertville soils, shallow:									
SE¼NW¼ sec. 1, T. 11 S., R. 3 W.	Interbedded shale and sandstone.	S34736	0–5	A_p	100	99	99	98	91
		S34737	5–12	B_2	------	------	------	100	99
Johnsburg loam:									
NW¼NW¼ sec. 19, T. 11 S., R. 2 W. (Thick B_2; no B_1 horizon.)	Colluvial fan accumulation.	S34728	0–8	A_p	------	------	------	------	100
		S34729	8–26	B_2	------	------	------	100	99
		S34730	26–44	B_{3m1}	------	------	------	100	99
		S34731	44–68+	B_{3m2}	------	100	99	98	97
Leadvale loam:									
NE¼SE¼ sec. 13, T. 11 S., R. 4 W. (Modal.)	Colluvial fan accumulation.	S34720	0–8	A_p	100	99	96	95	93
		S34721	10½–17½	B_2	------	------	------	100	99
		S34722	17½–26	B_{3m1}	------	100	99	99	97
		S34723	26–33	B_{3m2}	------	------	------	100	99
		S34724	33–55+	B_{3m3} or C	95	93	91	88	79
Pottsville shaly silt loam:									
SE¼SW¼ sec. 18, T. 12 S., R. 2 W. (Modal.)	Black fissile shale	S34732	0–5	A_p	100	99	98	97	93
		S34733	5–9	A–C	100	99	92	84	70
NE¼SW¼ sec. 4, T. 12 S., R. 2 W. (Thick C horizon.)	Interbedded shale and sandstone.	S34734	3–10	A_3	88	86	83	81	76
		S34735	10–26	C	------	100	99	98	89
Purdy silt loam:									
NW¼NW¼ sec. 29, T. 11 S., R. 2 W. (Modal.)	Alluvium (terrace)	S34738	0–8	A_p	------	------	------	------	------
		S34739	15–36	B_{2g}	------	------	------	------	------
		S34740	36–72	B_{3mg}	------	------	------	------	------

See footnotes at end of table.

soil samples taken from 18 soil profiles

Mechanical analysis [2]—Continued									Liquid limit	Plasticity index	Classification	
Percentage passing sieve [3]—Continued					Percentage smaller than [3]						AASHO [4]	Unified [5]
No. 4 (4.76 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
96	89	86	84	78	68	35	21	17	23	3	A–4(8)	ML.
96	96	93	92	89	84	67	56	50	60	26	A–7–5(18)	MH.
----------	100	95	94	88	79	54	38	27	41	13	A–7–6(9)	ML.
97	93	90	88	75	70	46	19	13	24	4	A–4(8)	ML–CL.
99	96	93	92	84	81	58	31	24	33	11	A–6(8)	ML–CL.
----------	100	99	99	95	93	75	48	39	52	20	A–7–5(14)	MH.
----------	100	99	99	96	93	75	52	40	53	22	A–7–5(15)	MH.

TABLE 11.—*Engineering test data* [1] *for*

Soil name and location	Parent material or parent rock	Bureau of Public Roads report No.	Depth	Horizon	Mechanical analysis [2]				
					Percentage passing sieve [3]				
					2 in.	1½-in.	1 in.	¾-in.	⅜-in.
Tilsit loam:			*Inches*						
SW¼SE¼ sec. 35, T. 8 S., R. 1 W. (No B_1 horizon.)	Sandstone and shale	S34756	0–6	A_p				100	99
		S34757	6–17	B_2				100	99
		S34758	17–27	B_{3m1}					100
		S34759	27–38	B_{3m2}					100
		S34760	38–65	B_{3m3} or C					100
Tilsit fine sandy loam:									
NE¼SE¼ sec. 33, T. 8 S., R. 1 W. (Modal.)	Sandstone and shale	S34748	0–6	A_p				100	99
		S34749	10–22	B_2				100	99
		S34750	23–34	B_{3m}				100	98
		S34751	34–61	C	91	91	89	87	84
NE¼NW¼ sec. 13, T. 9 S., R. 2 W. (Red D horizon.)	Sandstone and shale	S34752	0–5	A_p					
		S34753	9–27	B_2					100
		S34754	24–41	B_{3m}					100
		S34755	41–80	D					100
Tyler silt loam.									
SE¼NW¼ sec. 30, T. 11 S., R. 2 W.	Alluvium (terrace)	S34741	0–9	A_p					
		S34742	11–24	B_{1g}					
		S34743	37–60	B_{3mg}					
		S34744	60–85	C_g					
SE¼SE¼ sec. 33, T. 11 S., R. 3 W.	Alluvium (terrace)	S34745	7–21	B_{1g}					
		S34746	21–30	B_{21g}					
		S34747	40–72	B_{3g}					
SW¼NE¼ sec. 4, T. 12 S., R. 2 W.	Colluvial fan accumu-	S34725	0–8	A_p				100	99

soil samples taken from 18 soil profiles—Continued

Mechanical analysis [2]—Continued									Liquid limit	Plasticity index	Classification	
Percentage passing sieve [3]—Continued					Percentage smaller than [3]						AASHO [4]	Unified [5]
No. 4 (4.76 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
98	97	96	94	76	72	47	16	11	21	3	A–4(8)	ML.
97	96	95	93	78	75	51	22	15	24	6	A–4(8)	ML–CL.
99	98	97	95	76	73	49	26	19	28	9	A–4(8)	CL.
99	98	97	95	76	72	49	28	22	30	9	A–4(8)	ML–CL.
99	98	97	95	76	70	48	28	22	32	11	A–6(8)	CL.
97	96	95	82	48	45	29	12	7	[6] NP	[6] NP	A–4(3)	SM.
97	96	95	83	62	59	45	24	17	26	10	A–4(5)	CL.
95	92	91	77	52	49	36	20	14	22	6	A–4(3)	ML–CL.
82	80	79	68	50	47	40	28	22	36	13	A–6(4)	SM–SC.
		100	97	56	52	32	12	8	[6] NP	[6] NP	A–4(4)	ML
99	98	97	94	62	58	42	24	16	23	6	A–4(5)	ML–CL
99	98	97	94	52	48	34	18	13	19	3	A–4(3)	ML
99	98	97	94	50	47	38	29	26	24	11	A–6(3)	SM–SC
			100	97	90	55	22	16	29	6	A–4(8)	ML–CL.
	100	99	98	92	88	68	39	22	28	8	A–4(8)	CL.
	100	99	99	96	93	79	54	37	38	14	A–6(10)	ML–CL.
	100	98	97	92	89	77	56	40	41	18	A–7–6(11)	CL.
		100	99	84	80	56	27	17	20	3	A–4(8)	ML.
		100	99	89	86	68	42	31	30	11	A–6(8)	CL.
		100	99	88	84	64	42	33	36	15	A–6(10)	CL.
96	89	83	82	68	59	37	16	11	26	4	A–4(7)	ML–CL.
94	90	84	84	74	68	48	27	17	29	7	A–4(8)	ML–CL.
80	74	68	67	59	56	41	26	18	33	9	A–4(5)	ML–CL.

[3] All percentages except those for A_3 layer of Pottsville shaly silt loam are based on total material; fragments of shale and sandstone up to and exceeding 3 inches in diameter were discarded from A_3 layer of the Pottsville shaly silt loam before mechanical analyses.

[4] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes. AASHO Designation M 145–49.

[5] Based on the Unified soil classification system. Tech. Memo. No. 3–357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

[6] Nonplastic.

TABLE 12.—*Soil series classified by higher categories, and factors of soil formation that have contributed to differences in soils*

ZONAL SOILS

Great soil group and soil series	Topographic position	Parent material	Drainage	Slope range	Degree of profile development [1]	Generalized description of moist profile [2]
Red-Yellow Podzolic soils:				*Percent*		
Red members:						
Enders	Uplands	Residuum of weathered shale and sandstone.	Good	2–15	Strong	Dark grayish-brown to brown silt loam or loam surface soil over a red to yellowish-red silty clay loam to silty clay subsoil.
Linker	Uplands	Residuum of weathered sandstone and some interbedded shale.	Good	2–15	Strong	Dark grayish-brown to yellowish-brown fine sandy loam surface soil over a yellowish-red to dark-red clay loam to fine sandy clay loam subsoil.
Muse	Foot slopes	Old local alluvium from	Good	2–15	Strong	Dark grayish-brown to

TABLE 12.—*Soil series classified by higher categories, and factors of soil formation that have contributed to differences in soils*—Continued

ZONAL SOILS

Great soil group and soil series	Topographic position	Parent material	Drainage	Slope range	Degree of profile development [1]	Generalized description of moist profile [2]
Red-Yellow Podzolic						

TABLE 12.—*Soil series classified by higher categories, and factors of soil formation that have contributed to differences in soils*—Continued

INTRAZONAL SOILS—Continued

Great soil group and soil series	Topographic position	Parent material	Drainage	Slope range	Degree of profile development [1]	Generalized description of moist profile [2]
Low-Humic Gley soils:				*Percent*		
Atkins	Depressions in uplands and along drainageways.	Recent local alluvium washed from upland areas underlain by sandstone and shale.	Poor	0–2	Weak	Grayish-brown or dark grayish-brown to gray, faintly to distinctly mottled silt loam surface soil over gray, distinctly to prominently mottled silt loam or loam subsurface layers.
AZONAL SOILS						
Alluvial soils:						
Philo	Flood plains	Recent general and local alluvium washed from upland areas underlain by sandstone and shale.	Moderately good.	0–2	Very weak	Brown to dark-brown or dark grayish-brown loam surface soil over brown to dark-brown loam subsurface layers that are mottled at a depth ranging from 18 to 24 inches.
Pope	Flood plains	Recent general alluvium washed from upland areas underlain by sandstone and some shale.	Good	0–2	Very weak	Dark-brown to dark grayish-brown fine sandy loam surface soil over dark-brown fine sandy loam subsurface layers.
Alluvial soils (intergrading to Low-Humic Gley soils):						
Stendal	Swales, depressions, and at heads of and along drainageways.	Recent local alluvium washed from upland areas underlain by sandstone and shale.	Somewhat poor.	0–2	Weak	Olive-brown to light olive-brown silt loam surface soil over distinctly mottled, grayish-brown or light yellowish-brown silt loam subsurface layers.
Lithosols (intergrading to Red-Yellow Podzolic soils):						
Muskingum [3]	Uplands	Residuum of weathered sandstone and some weathered shale.	Excessive	10–45	Very weak	Very dark gray to very dark grayish-brown stony fine sandy loam surface soil and thin, yellowish-brown stony fine sandy loam subsurface layers; depth to bedrock ranges from 10 to 20 inches.
Pottsville	Uplands	Residuum of weathered acid shale, some weathered sandy shale, and some weathered sandstone.	Excessive	2–45	Weak	Grayish-brown to yellowish-brown shaly silt loam surface soil over thin, yellowish-brown shaly silty clay loam or silty clay subsurface layers; depth to bedrock ranges from 8 to 20 inches.

[1] Estimated from the number of important genetic horizons and the degree of contrast between the horizons.

[2] Profiles described have not been materially affected by erosion.

[3] As mapped in this county, the Muskingum soils are somewhat shallower and more sandy and have weaker profile development than the Muskingum soils of other areas, particularly to the north.

The degree of maturity of these soils varies somewhat, but all are old enough to have a profile that has distinctly developed horizons.

Yellow members. Soils of the Albertville, Hartselle,

Reddish-Brown Lateritic soils

The Reddish-Brown Lateritic soils have a well-drained profile with a dark reddish-brown, granular surface soil;

dense or compact B horizon than that in typical zonal soils, but the degree of development varies.

The Planosols in this county developed in a climate similar to that in which the typical zonal soils developed, but they are generally more moist and more poorly aerated. The vegetation on the Planosols was probably somewhat different from that on the Red-Yellow Podzolic soils, but deciduous forests predominated on both. Most Planosols appear to be older in development than the Red-Yellow Podzolic soils because they have a leached or lighter colored surface soil and a more compact subsoil. Because of the relief of Planosols, geologic erosion has been slow. But slow geologic erosion alone is not likely to have been responsible for the formation of Planosols. Possibly, slow internal drainage, combined with slow surface drainage and unusual siltiness of the parent material, has caused the abnormal cementation in or below the B_1 horizon.

Low-Humic Gley soils

The Low-Humic Gley great soil group consists of somewhat poorly drained and poorly drained soils that have a very thin surface horizon and a moderately high content of organic matter. Their surface soil is underlain by mottled gray and brown, gleyed mineral horizons that do not differ greatly from the surface horizon in texture (*9*).

The Atkins soils are the only Low-Humic Gley soils in this county. They are poorly drained and are forming on the plateau in local alluvium along the many narrow drainageways and draws and in depressions.

Alluvial soils

Alluvial soils are forming in alluvium that was deposited fairly recently. Because the soil-forming processes have not had enough time to modify this alluvium, these soils lack genetically related horizons and strongly reflect the character of the Alluvial deposits in which they are forming.

The Alluvial soils in Cullman County are of the Pope, Philo, and Stendal series. These soils are forming in similar parent material, but they range from well drained to somewhat poorly drained. They are on first bottoms along streams, in narrow drainageways and draws, and around the heads of drainageways.

The Pope soils are deep and well drained. They have

Lithosols

Lithosols are azonal soils that have no clearly expressed soil morphology. They consist of a freshly and imperfectly weathered mass of hard rocks or hard rock fragments and are mostly on steep slopes (*9*). They have developed where there was ample moisture and generally consist of material that erodes easily.

The Muskingum and Pottsville soils are classified as Lithosols in this county. Because their profiles include weakly expressed, discontinuous B or BC horizons, however, they are recognized as intergrading to the Red-Yellow Podzolic group.

These soils have the same general relief, but they differ mainly in parent material. The Muskingum soils formed in material weathered chiefly from acid sandstone but partly from thin beds of acid shale. Their depth to bedrock normally ranges from 10 to 20 inches. Stones are common on these soils. The Pottsville soils formed in material weathered mainly from acid shale but partly from sandy shale. Bedrock is at a depth of 8 to 20 inches. Fragments of shale are common on and in these soils.

Glossary

Acidity. The degree of acidity or alkalinity of a soil mass, expressed in pH values or in words, as follows:

	pH		*pH*
Extremely acid	below 4.5	Neutral	6.6–7.3
Very strongly acid	4.5–5.0	Mildly alkaline	7.4–7.8
Strongly acid	5.1–5.5	Moderately alkaline	7.9–8.4
Medium acid	5.6–6.0	Strongly alkaline	8.5–9.0
Slightly acid	6.1–6.5	Very strongly alkaline	9.1 and higher

Aggregate (of soil). Many fine soil particles held in a single mass or cluster, such as a clod, prism, crumb, or block.

Alluvium. Soil material deposited on land by streams.

Available moisture. That part of the moisture in a soil that can be taken up by plants at rates significant to their growth.

Bedrock. The solid rock underlying soils and other earthy surface formations.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that contains 40 percent or more of clay, less than 45 percent of sand, and less than 40 percent of silt.

PLASTIC. Soil material forms wirelike shape when rolled between thumb and forefinger, and moderate pressure is required to deform the soil mass.

STICKY. After pressure, soil material adheres to both thumb and forefinger and tends to stretch somewhat and pull apart rather than to pull free.

Contour tillage. Plowing or cultivating at right angles to the natural direction of slope, at the same level throughout, and ordinarily at reasonably close intervals.

Cropland. Land regularly used for crops, except forest crops. Cropland includes rotation pasture, cultivated summer fallow, and areas ordinarily used for crops but temporarily idle.

Crumb structure. Very porous, granular structure in soils.

Drainage, soil. The rapidity and extent of the removal of water from the soil by runoff, by flow through the soil to underground spaces, or by both processes. As a condition of the soil, drainage refers to the frequency and duration of periods when the soil is free of saturation. Terms used to describe drainage are *runoff, internal drainage, permeability,* and *natural drainage.*

RUNOFF. The surface flow of water from an area, or the total volume of surface flow during a specified time. The amount and rapidity of runoff is closely related to slope, and it is affected by the texture, structure, and porosity of the surface soil. The relative degrees of runoff are *ponded, very slow, slow, medium, rapid,* and *very rapid.*

INTERNAL DRAINAGE. The movement of water through the soil profile. Terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

PERMEABILITY. The quality of a soil that enables it to transmit water and air. The classes of permeability are *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

NATURAL DRAINAGE. Drainage that existed during the development of a soil, as opposed to altered drainage. The terms used to express natural drainage are *very poorly drained, poorly drained, imperfectly drained* or *somewhat poorly drained, moderately well drained, well drained, somewhat excessively drained,* and *excessively drained.*

Erosion. The wearing away of the land surface by detachment and transport of soil and rock materials through the action of moving water, wind, and other geological agents. The classes of erosion used in this report are *slightly eroded, moderately eroded, severely eroded,* and *gullied land.*

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of plants when light, moisture, temperature, and the physical condition of the soil are favorable.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Forest. Land not in farms, bearing a stand of trees of any age or size, including seedlings, and of species that attain a minimum average height of 8 feet at maturity on land from which such

Massive, soil. Large uniform masses of cohesive soil, sometimes with poorly defined and irregular breakage, as in some of the fine-textured alluvial soils; structureless.

Mottled. Irregularly marked with spots of color. Descriptive terms for mottles are: For contrast—*faint, distinct,* and *prominent;* for abundance—*few, common,* and *many;* and for size—*fine, medium,* and *coarse* (*6*).

Nutrient, plant. Any element taken in by a plant, which is essential to its growth and used by it in elaboration of its food and tissues. These elements include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and other elements obtained mainly from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Parent material. The unconsolidated mass of rock material (or peat) from which the soil profile develops. Horizon C of the soil profile.

Permeability, soil. (See Drainage, soil.)

Productivity, soil. The capability of a soil to produce a specified plant or sequence of plants under a defined set of management practices.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Relief. Elevations or inequalities of the land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils. Diameter of the fragments ranges from 0.05 millimeter to 2.0 millimeters. As a soil textural class, soil material that contains 85 percent or more of sand and not more than 10 percent of clay.

Silt. Individual mineral particles of soil that range in diameter between the upper size of clay, 0.002 millimeter, and the lower size of very fine sand, 0.05 millimeter. As a soil textural class, soil material that contains 80 percent or more of silt and less than 12 percent of clay. The term "silt" is also used for water-deposited sediment that has individual grains approximately the size of silt, although the term is sometimes applied loosely to sediment containing considerable sand and clay.

Soil. The natural medium for the growth of land plants. A soil is a natural three-dimensional body on the surface of the earth, unlike the adjoining bodies.

Stripcropping. The practice of growing crops in a systematic arrangement of strips, or bands. Generally, cultivated crops and sod crops are alternated in strips to protect the soil and vegetation against running water or wind. Alternate strips are laid out approximately on the contour on erosive soils or at approximate right angles to the prevailing direction of the wind where soil blowing is a hazard.

Structure, soil. The aggregation of primary soil particles into compound particles, or clusters of primary particles, which are separated from adjoining aggregates by surfaces of weakness. Soil structure is classified according to distinctness

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GUIDE FOR MAPPING UNITS

Map symbol	Soil name	Page	Capability unit	Page	Woodland suitability group	Page
AbB	Albertville loam, 2 to 6 percent slopes	10	IIe–7	31	3A	44
AbB2	Albertville loam, 2 to 6 percent slopes, eroded	10	IIe–7	31	3A	44
AbC	Albertville loam, 6 to 10 percent slopes	10	IIIe–7	33	3A	44
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AcB3	Albertville silty clay loam, 2 to 6 percent slopes, severely eroded	10	IIIe–7	33	5B	46
AcC3	Albertville silty clay loam, 6 to 10 percent slopes, severely eroded	11	IVe–7	35	5B	46
AcD3	Albertville silty clay loam, 10 to 15 percent slopes, severely eroded	11	VIe–2	36	5B	46
At	Atkins silt loam, local alluvium	11	IVw–2	35	1	42
EnB2	Enders silt loam, 2 to 6 percent slopes, eroded	12	IIe–7	31	4B	45
EnC2	Enders silt loam, 6 to 10 percent slopes, eroded	12	IIIe–7	33	4B	45
ErC3	Enders and Albertville silty clay loams, shallow, 6 to 10 percent slopes, severely eroded.	13	VIe–4	36	7	46
ErD3	Enders and Albertville silty clay loams, shallow, 10 to 15 percent slopes, severely eroded.	13	VIIe–2	37	7	46
EsB2	Enders and Albertville soils, shallow, 2 to 6 percent slopes, eroded	12	IIIe–9	33	4B	45
EsC2	Enders and Albertville soils, shallow, 6 to 10 percent slopes, eroded	13	IVe–9	35	4B	45
EsD	Enders and Albertville soils, shallow, 10 to 15 percent slopes	13	VIe–4	36	4B	45
EsD2	Enders and Albertville soils, shallow, 10 to 15 percent slopes, eroded	13	VIe–4	36	4B	45
EsC3	Enders and Muse soils, 6 to 15 percent slopes, severely eroded	12	IVe–7	35	5B	46
Gu	Gullied land	14	VIIe–1	36	8	46
HaB2	Hanceville loam, 2 to 6 percent slopes, eroded	14	IIe–2	30	4B	45
HaC2	Hanceville loam, 6 to 10 percent slopes, eroded	14	IIIe–2	32	4B	45
HrB	Hartsells fine sandy loam, 2 to 6 percent slopes	15	IIe–2	30	5A	45
HrB2	Hartsells fine sandy loam, 2 to 6 percent slopes, eroded	15	IIe–2	30	5A	45